amateur radio

VOL. 44, No. 7 JULY, 1976

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COVER PHOTO

Group of delegates at the IARU Region 2 Conference held in Miami, Florida in April, 1976.

From left to right — **Back Row:** John Alloway G3FKM, Mick Percival 9Y4NP, George Spencer VE4IM, Ron Hesler VE1SH, Roy Stevens G2BVN.
Front Row: Peter Parker VP9GO, Charles Tweedle W1DPL/6Y5, Tim Hughes G3GVV, David Wardlaw VK3ADW, Mike Owen VK3KI, Noel Eaton VE3CJ.

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

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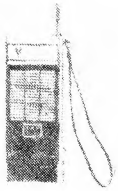

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amateur radio

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QSP SHF FRONTIERS

One of the resolutions of the Federal Council passed at the recent convention was to seek the allocation of Amateur bands above the present maximum frequency allocation of 24 to 24.25 GHz as applied in Australia.

To some it will seem hard to imagine what possible use could be made of these frequencies.

However, the council of the WIA, mindful of the future possibility of radically new techniques becoming available, made this decision in order that the amateurs of the future will, as widely as possible, be able to be involved in all areas of the spectrum.

One of the main jobs of the WIA is to preserve and try to improve the privileges of the amateur service for the future generation.

This resolution is one way it can be seen to be in action.

There are still frontiers for the amateur. Do not just read about other people's achievements! How about joining in? The amateur bands in these lesser known areas of the spectrum are for your use.

DAVID WARDLAW, VK3ADW,
Federal President. ■

EDITOR'S DESK

Bill Roper, VK3ARZ

For the past few years general news about division, zone, and club activities has not been included in the pages of AR. This was done mainly for economic reasons.

Instead, this information has been made available within each State, through the medium of divisional bulletins or newsletters, most of which are now included as inserts in AR.

Amongst other things, one interesting advantage of these newsletters is the much later closing date for submission of copy.

However, it is considered that there would be certain advantages in publishing, in a special column in AR, dates and addresses of division, zone, and club meetings and activities — a form of "events calendar".

We have attempted to produce such a calendar in the past, but without much success. We are not clairvoyant. We can only publish information supplied to us.

Do you think such an "events calendar" would help your division, zone or club?

Will you, the division/zone/club secretaries and publicity officers help?

And when you do submit the necessary details, why not think up to three months ahead?

If you glance at the left hand column on this page you will note some changes in titles of the people who help make AR magazine a reality.

A tremendous amount of time and effort is needed each month just on the mechanics of production alone.

I can no longer carry this work load, even with the able assistance of Bruce VK3UV. Therefore, Ron VK3AFN has agreed to join the production team and the load will now be split three ways.

Hopefully, one of the many advantages of this change will be more time for us to look closely at the philosophy and policy of AR magazine.

Ron's move means that we now need at least one new Technical Editor.

Any volunteers? ■

QSP

UNLICENSED AMATEUR-LIKE ACTIVITY

From Ham Radio Report via CORA comes news from the USA of unlicensed amateur-like activity by an "HF" gang using "HF", "HFA" and "HFB" series "calls" in the citizen's band on 11 m. There is a fear that these illegal stations will be using the 10 m band. And whilst on 10 m incidentally, the FCC are reported as permitting repeaters between 29.5 and 29.7 MHz.

PASSENGERS FLEE FROM BUS BLAZE

Enthusiastic bushwalker, Ned Rowse VK3AEA on a hike on Mt. Buffalo on Easter Monday had taken with him a borrowed hand held transceiver and found Ch. 40 exceptionally good. Whilst descending The Hump he heard the noises of an accident on the mountain road followed by a thunderous boom, then a huge column of fire and smoke and screams from many people. Ned put out a call for help which was answered by VK2ZIE in Beechworth who alerted the local Police. Ned then hurried down to help the passengers out of the blazing bus and offer comfort. The ambulance duly appeared 30 odd minutes later followed by the Police and National Park Ranger. A further call, answered by VK2BOX, resulted in a replacement bus and other assistance. As a matter of interest, an amateur passenger in the bus had been persuaded to travel without his hand held unit.

LICENCE IRREGULARITIES

The editorial in Radio Communications June '76 deals with the need for amateurs to maintain and improve their technical and operational standards most particularly during the years leading up to WARC 79 and ends with the comment "A suggestion has been made that an Amateur Radio observation service be established in the UK and plans are being made to develop such a system during the next few months . . . While it is inevitable that there will be some who will be against an observation service, most of us will welcome anything which will benefit our hobby. Perhaps the biggest objectors could be our biggest offenders".

USA REPEATERS

According to QST April '76 the latest repeater count for continental USA is 2034.

WIANEWS

The AR Special elsewhere in this issue gives an outline of the 1976 Convention matters.

At the Executive meeting late in May the chairman of the Project Australis Group reported in some detail on his visit to Washington. The possibilities of a launch date for Oscar 8 being advanced to 1977 coupled with a difference in configuration of the launch vehicle appear to have created problems in modifications to the hardware. His visit demonstrated the necessity to keep in close touch with overseas developments.

The days when amateur radio societies and groups could safely pursue their own policies independent of anyone else have long ago become obsolete. WARC '79 above all exemplifies the necessity for closely detailed co-operation at all levels in the amateur service.

The Executive approved a change in arrangements for the production of AR consequent upon submissions from Mr. Roper, VK3ARZ. There is to be no call book printed by the Institute this year. Instead, negotiations for a fresh contract with the Department from 1977 onwards were begun with an interview between Mr. Roper and Mr. Williamson of Central Office early in June. The use of our existing EDP membership records illustrates the relative simplicity of producing an offset printing of the call book from computer records.

Mr. Roget will be attending the NZART Golden Jubilee celebrations in Auckland early in June as the official WIA representative. He carries with him a brief on various matters to be discussed with that Society.

The Education Co-ordinator is Mr. Graeme Scott, VK3ZR, a member of the Executive and himself a technical educator. Arising from the 1976 Convention his field of activity is very great since it encompasses not only the educational and instructional areas but also the follow-on areas of examinations and exemptions. The latter are of course of current interest particularly in relation to the long delays now experienced in the results of amateur examinations being announced.

The thoughts expressed at the Convention by Mr. Jim Wilkinson on the subject of the Department itself continuing to run the amateur examinations are interesting. He wondered if it might be more appropriate for these to be undertaken by some suitable educational authority. One's immediate thought on this is, of course, the example of the City and Guilds Institute in London in respect of RAE examinations in Britain and in British overseas territories even as far afield as the Solomons.

Mr. Scott will be assisted by a small sub-committee of his choice but since this is an activity on a national level he will need a vast amount of information from everywhere in Australia.

He will need to know the current attitudes to radio amateur courses of instruction which can or cannot be carried out through Education Department channels, what support, if any, is given by the authorities, what scope exists for classes in such other areas as advanced colleges, adult education facilities, evening classes of any kind, the extent and scope of correspondence courses and a great amount of other relevant background material. It will then become clear to consider the Institute's involvement and whether or not there is a real need for the Institute at a national level to produce standard material to foster and encourage an interest in radio communications and electronics especially in the fields of amateur radio activity.

The Educational programmes inevitably lead up to examinations and this is something which most candidates will agree needs considerable investigation. Allied to this is of course the exemptions field either through acceptable standards achieved through pre-existent examinations or the development of activity in setting and conducting examinations by some other acceptable organisation.

How soon the results of all these investigations can be brought to fruition depends to some extent on the co-operation of members sending in a wealth of documented material suitable for consideration.

A considerable amount of material is already on hand, or is available, from one specialised area — namely YRCS. Additional material is also available or can be sought about Divisional and Club classes at various levels. A lot of feedback on other material is needed and interested members are now asked to send in as much detailed information as they can to Mr. Scott via the Executive's address in Toorak.

Another specialist area on which Executive requires assistance is RFI and accordingly the Moorabbin and District Radio Club have been approached to see if they can suggest somebody suitably qualified to undertake the work of EMC Co-ordinator.

On the Executive itself Mr. Peter Wolfenden, VK3ZPA, has been elected as Executive Vice-Chairman for the coming ye[illegible] and all the existing appointments to sub-committees have be[illegible] recommended to continue in office.

The Department has now replied that it does not favour the use of "AX" prefixed call signs by amateurs for the period 1st July 1976 to 31st July 1977 but is prepared to authorise this use during the period of HM The Queen's visit to Australia next year to mark the 25th anniversary of her accession to the throne.

The Executive also spent much time in examining ways and means designed to improve membership recruitment, the image of amateur radio in the media and elsewhere by advanced public relations techniques and to show the non-member exactly what the Institute is doing and why. An improvement in the educational area is certainly one way to attract new members and another, via the medium of Divisional broadcast tapes, can and does help in disseminating Institute activities to the non-member listeners. A strong Institute geared ready for WARC 79 cannot be too strongly emphasised.

All these are areas where individual members can assist the common cause not only by supporting the Institute and helping to spread the word on what is being done but also by assisting in recruiting new members or persuading those who have dropped out that at the very least their moral and financial support is valuable.

Amongst other propositions the Executive approved an adv[illegible] tising drive coupled with the production of a new publicity fol[illegible] to replace the old free issue "So you want to become a radio amateur" which is out of print.

Above all, the Executive felt severely hampered by the lack of the services of a well qualified publicity expert. If any reader knows of a good PR man who can spare a little time for the Institute on a voluntary basis do please let us have his name quick.

Finally, if all this isn't enough, the Executive hopes that members will not forget to write to their Division about the Arnold Report in April AR. ■

QSP

CLUB LIABILITY INSURANCE

"Many clubs and societies do not have adequate insurance to protect them against claims arising from injury to or damage to the property of members of the public. The RSGB reminds members that the consequences of a serious claim can be disastrous for an unincorporated club holding no capital, and these consequences may result in individual members being faced with liabilities quite beyond their means". Radio Communications June '76.

NETHERLANDS D-LICENCE

April QST reports further about the Netherlands new amateur licence with very limited VHF privileges in an effort to persuade illegal operators of 27 MHz equipment to enter amateur radio legitimately. The first exams held on 26-11-1975 resulted in a pass rate of 64% of the 1160 applicants. Type approved equipment may only be used but VERON is working to have this restriction lifted.

CHANGE OF NAME

For DX-ers information the former Republic of Dahomey is now officially named the People's Republic of Benin. Telecommunications Journal March '76.

SISTER CITIES INTERNATIONAL

QST for Feb. '76 records that the ARRL has formally adopted a "Co-operative Understanding" with Sister Cities International. The editorial goes on to say "No one can deny that amateur radio needs more international exposure; and SCI is one way to obtain it".

160 M BAND

News in "Break-In" April '76 is that New Zealand amateurs have now been granted the use of an additional 10 kHz segment in the 160 m band. This is from 1803 to 1813 kHz.

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W4 WATTMETER/SWR METER 2 — 30 MHz with 200 Watt and 2000 Watt ranges. **$65.00.**

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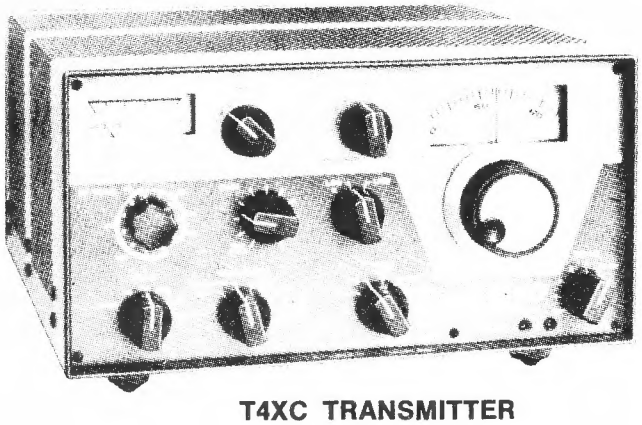
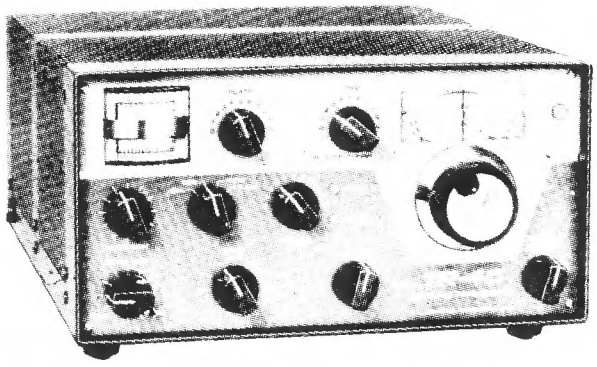


T4XC TRANSMITTER



TR4C TRANSCEIVER

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P.O. Box 30, Concord, N.S.W. 2137.
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DOUBLE DELTA BEAM

L. H. Vale VK5NO
29 Carlton Rd., Gawler, S.A. 5118

A new and unique antenna is described by one of our regular contributors. It may not be as elegant in appearance as a Yagi, but it is no less graceful in appearance than a quad. It is sturdy and probably equal in performance to any rotatable beam available to the amateur today.

The double delta antenna is the result of attempts to make a beam that would be able to be put single-handed onto the top of a fifty-foot TV tower that could be let down to lay almost along the ground; it was hoped that such an antenna could be made simply and cheaply without sacrificing performance. A beam was first made for 15-metres and results were so good that, after a month, it was taken down and replaced by a 20-metre model. A month or so later that again was taken down and the 15-metre beam, with a slight modification, was put inside the 20-metre beam and they were both fed from the same coax and coax balun. So far attempts to put a 10 metre beam inside of the other two to make a tri-bander have not been successful, because of interaction effects.

However, after a year and some necessary mechanical improvements, the beam is still in frequent use.

The main disadvantages of the beam are its size and the fact that it is bi-directional; that is, it has a front-to-back ratio of 1:1. I have not found the bi-directionality to be objectionable; rather I find it quite an asset, but no doubt it would be quite unacceptable to some.

It is presented as being an original idea with the hope that others may be interested enough in it to improve on it.

In plan view, the overall dimensions are about the same as a two-element Yagi but like a quad, it has a vertical dimension also; in this case about 0.4 of a wavelength, as against the quad's 0.25 wavelength.

Fig 1 is a schematic diagram of the antenna. Two deltas or triangular elements, each with sides of half a wavelength, are mounted with their bases parallel and horizontal and their apexes at a common point vertically above the centre-point of the base rectangle. At the common apex point the delta-sides from diagonally-opposite corners are connected together. The feed point is midway along one of the base sides. The antenna radiates perpendicularly to the base sides, equally well in both directions, with a figure 8 pattern in the horizontal plane.

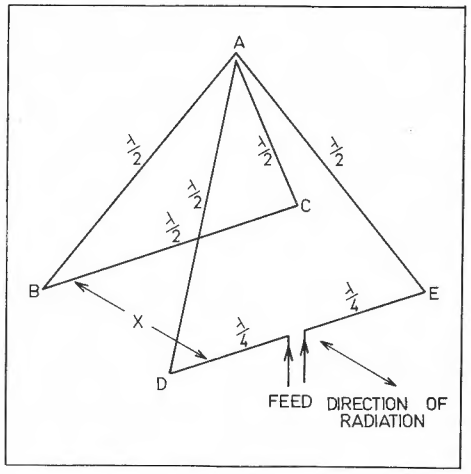

Figure 1:
Schematic diagram of Double Delta Beam

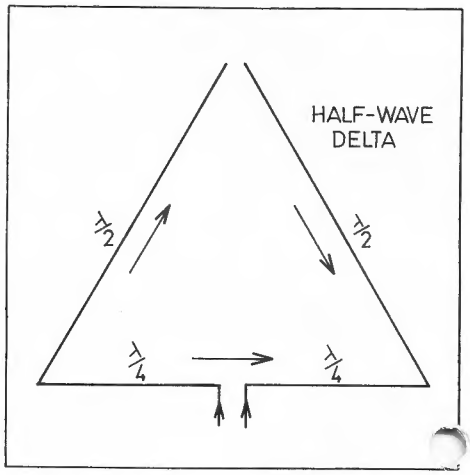

Figure 2A: Delta Antenna Configuration

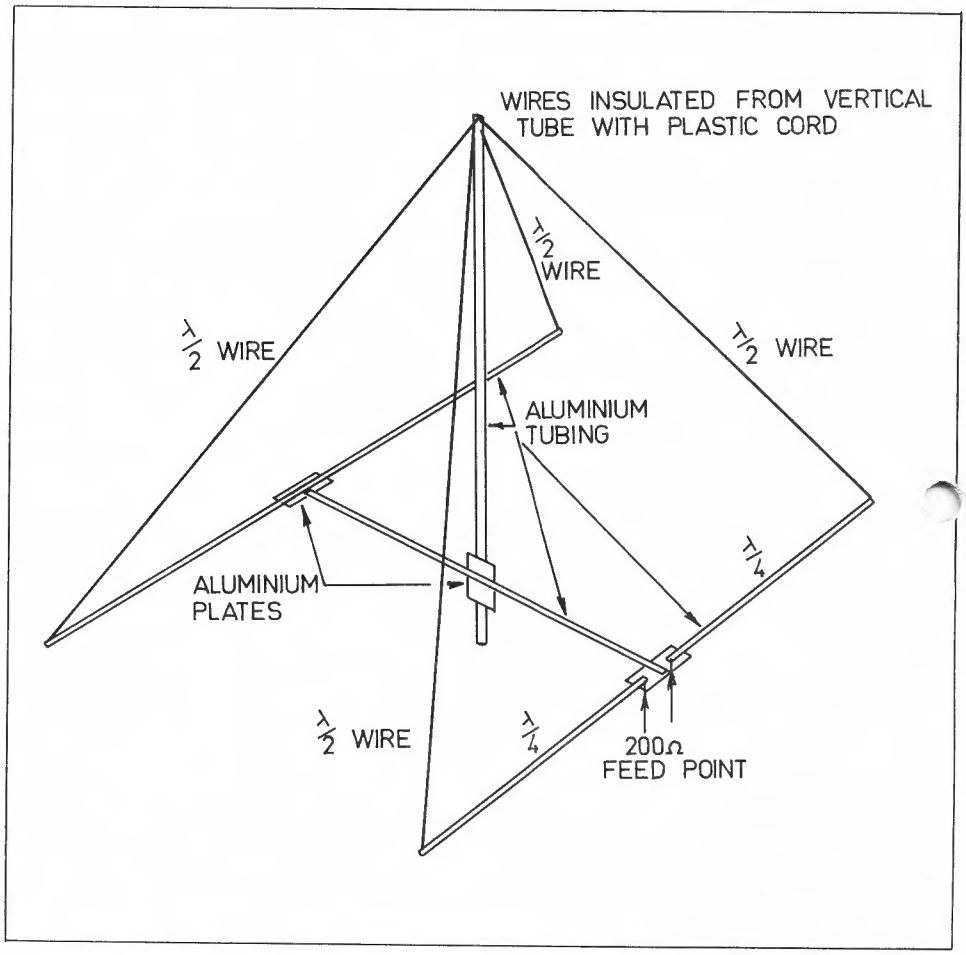

Figure 3: First Constructional Method

The impedance at the feed point varies with the dimension X. With X = 12 feet for 15 metres (18 feet on 20 metres) the feed point impedance is close to 200 ohms, allowing a balun to be used to obtain a low SWR on 50 ohm coax feed cable.

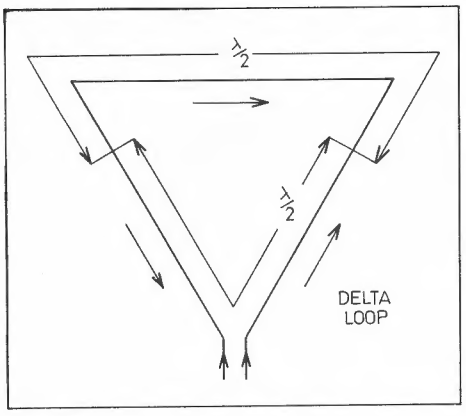

Figure 2B: Delta Antenna Configuration

The antenna could be described as two contra-rotating single-turn helices connected at the points remote from the feed point; in Fig 1, midway along side BC.

Some of the reasoning behind the development is as follows: (refer to Fig 2). A single delta antenna can have at least two sets of dimensions. In the "delta loop" (shown in the usual configuration) the sides are each one-third of a wavelength long, so that the total length around the loop is two half wavelengths.

The feed point, being half a wavelength from the short circuit on the opposite side of the loop, is low impedance. The small arrows on the diagram represent the phasing of the current in the antenna at a given instant; it will be seen that the loop gives the effect of two half wave dipoles in phase (the upper one with the ends folded down and the lower one bent upwards in the centre) with their average effective spacing less than a quarter of a wavelength apart in the vertical plane.

The "half-wave delta" has sides of half-a-wavelength, but the point opposite the feed point (in this case the apex) is open circuited so that a low impedance is reflected to the feed point. Each of the sides is still phased correctly for broadside operation but the larger size of the loop makes it more directional than the delta loop with one-third-wavelength sides. It would be expected that the lack of bent half waves should reduce side lobes but I have not had the means to investigate this.

For the double delta I have simply connected two of these half wave deltas together at the apex in such a way that they are in opposite phase to each other (in the fashion of an 8JK beam) so that radiation in the vertical plane and the horizontal plane off the side of the beam tends to cancel, further increasing the directional effects of the single loop. The antenna would presumably be more effective if the planes of the deltas were parallel and vertical rather than sloping in toward the apex, but this would complicate construction.

Two methods of construction have been used; these are illustrated in Figures 3 and 4.

In the construction of Fig 3, the two base elements are made of aluminium tubing supported by a horizontal boom in the fashion of a two element Yagi and, from the centre of the horizontal boom, a vertical boom is added to support the remaining wire sides of the deltas at the apex, where the wires are cross-connected. This method of construction has been found to be very good electrically insofar that extremely deep nulls were obtained off the side of the beam, but it leaves much to be desired mechanically, as it is necessary to insulate one of the base tubes at the centre feed point and also it is not possible to make the beam self bracing.

A more satisfactory method of mechanical construction is shown in Fig 4. The antenna elements are now made entirely of wire (in my case 40/0076 flexible hook-up wire because this was available). A cross spider of 22 mm aluminium tubing is used to support the base sides of the elements and the whole beam is self-guyed with plastic venetian blind cord. It has been found necessary to insulate the spider at the centre hub (which is a piece of ⅛" aluminium sheet to which the spider tubes are fixed by U bolts), and also mid-way along their length, with 1¼" plastic conduit, which is a sliding fit over the tubing. At the centre hub the plastic conduit fits over the tubing and into the U bolts, tightening down firmly; in the centre about 2 feet of conduit has saw-cuts at the end enabling it to be clamped over the

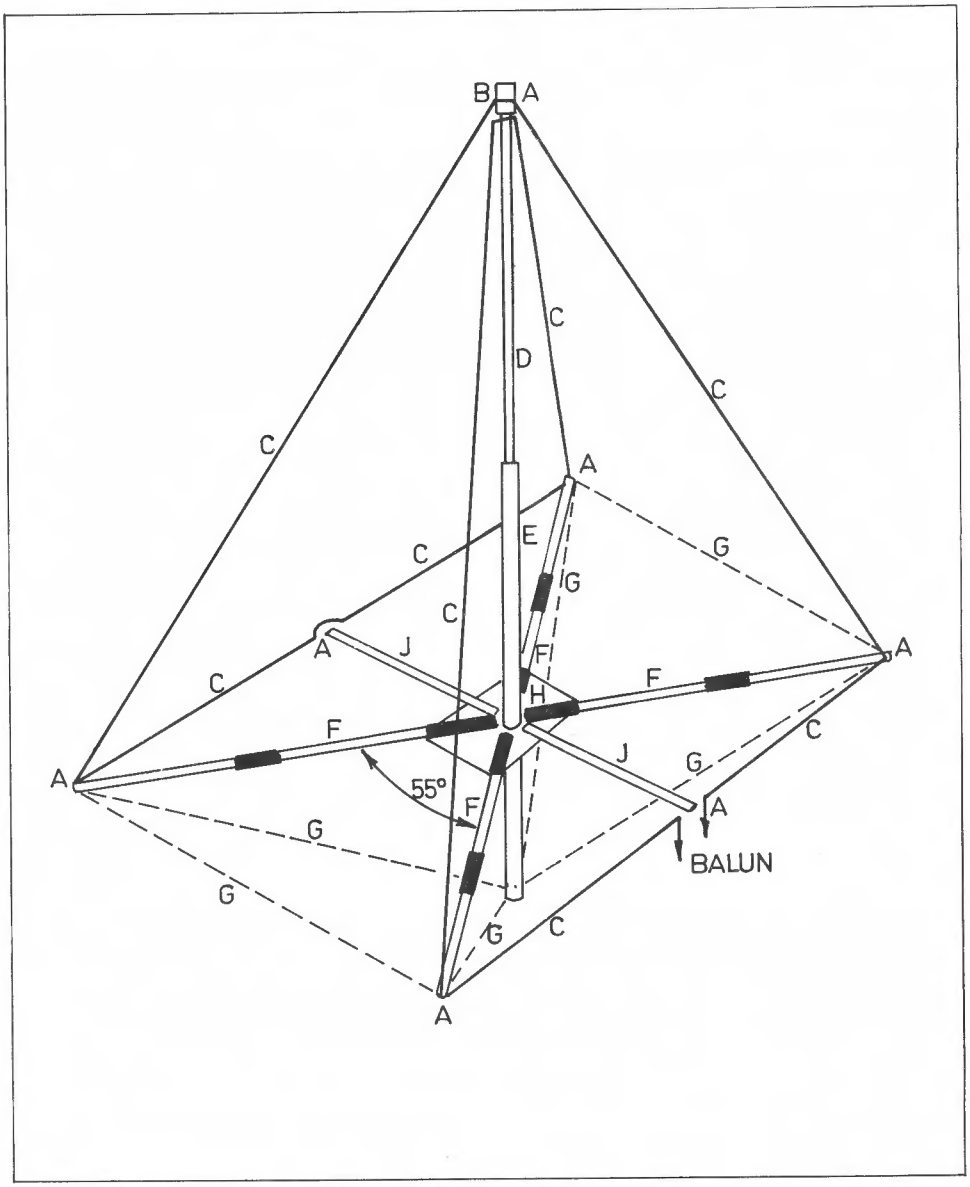

Figure 4: Present Constructional Method

KEY TO FIGURE 4

A. Wires insulated from metal with plastic cord.
B. Small metal plate fixed to vertical boom.
C. Wire elements. 40/0076 hook up wire.
D. 40 mm Aluminium tubing, 6 m long, telescoped and clamped into 2" tubing (E).
E. 2" x 16G aluminium tubing. 18' long.
F. 28 mm aluminium tubing, 6 m long. Insulated in centre and at centre hub with 1¼" plastic conduit.
G. Plastic cord bracing wire.
H. Centre hub 1/8" aluminium plate. Spider tubes are fixed with U bolts (insulated with 1¼" plastic conduit). Hub is fixed to vertical boom with 4 brackets and hose clips.
I. 28 mm aluminium tubing 9' long (14 MHz) fixed to hub with U bolts.

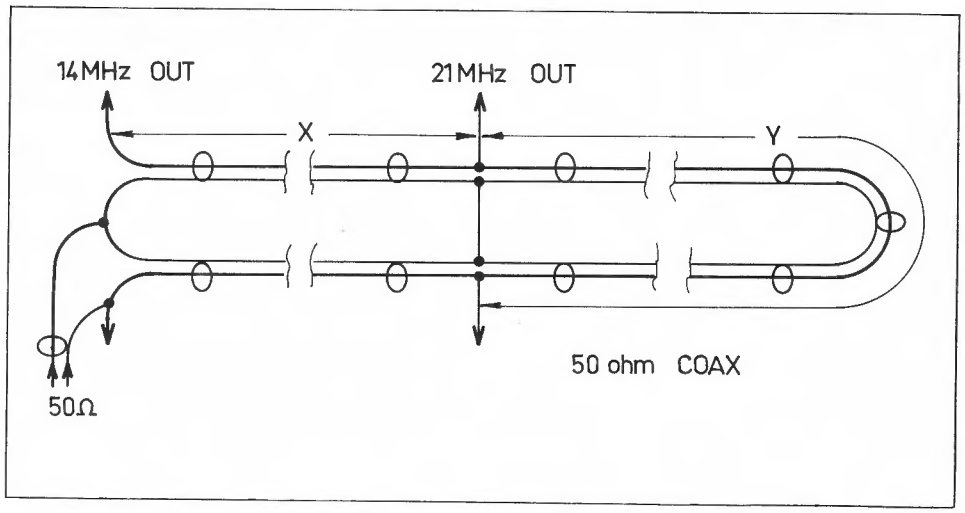

Figure 5: Coax Balun

tubing with automobile hose-clips, making certain that the two tubing ends are separated inside the conduit. Completely insulating material for the spider would probably enable the off-the-side nulls to be reduced but the effect of this on the main lobes would be negligible.

It has been found necessary to make the vertical boom as rigid as possible. The antenna should be considered as hanging from the apex. The present vertical boom (for a 20/15 metre dual-band double delta) consists of an 18 feet length of 2 inch 16 gauge tubing, 2 feet of which is inserted into the top of the tower, into which is telescoped a 6 metre length of 40 mm tubing, up to the apex. The centre hub supporting the spider is located 7 feet up from the bottom of the 2 inch tubing (5 feet up from the top of the tower).

Dimensions of my beam are given in Fig 4. I have found it necessary to prune the length of the elements to obtain a low SWR, but this brought no noticeable improvement in performance. The dimensions of the first 15 metre double delta were subsequently found to be about a foot per side too short; this gave me a very high SWR (about 3:1) but had no other effect on performance.

Small lengths of tubing are added to the spider to support the balun and feed cable and also a stub on the 15 metre beam.

The feed impedance at resonance is 200 ohms, so that feeding the beam with a balun of 4:1 impedance ratio enables the SWR to be reduced to 1:1. A coax balun is used here as that also enables beams for both 15 and 20 metres to be fed from the one coax feed line. A schematic diagram of the coax balun with dimensions for 15 and 20 metres is shown in Fig 5. Only those portions required need be used. The dimension Y is an electrical half-wavelength in the 50 ohms coax used at the required 15 metre band frequency and $2X + Y$ is the same for the 20 metre band frequency.

To prune the elements to size, the SWR readings were taken over the band; this showed which way pruning was required. Ideally all six half waves should be pruned to keep them the same length, but I only pruned one delta, with no apparent effect on performance. In fact, apart from obtaining a low SWR at the resonant frequency, and that does seem to be the "in" thing, the whole pruning exercise had no apparent effect on performance.

The existing 15/20 metre dual-band double delta beam is constructed with the method shown in Fig 4 and uses a coax balun as shown in Fig 5. The 15 metre beam apex is 2/3 of the distance up the vertical boom to the 20 metre apex and the base wires are supported 2/3 of the distance out of the spider tubing. It is necessary to put a quarter-wave open stub in the centre of the 15 metre base element opposite the feed point in order to avoid interaction with the 20 metre beam. This stub is made from 300 ohm air spaced cable and is supported by the centre boom.

To insert the beam into the top of the tower (which is made to accommodate 2 inch tubing) one of the diagonal spider members is unbolted from the centre hub and also the adjacent small piece of support tubing. The tower is lowered to be almost on the ground (I have a winch and tackle to do this) and the bottom of the vertical boom, which has been laid along the ground, lifted up and inserted into the top of the tower. The tower is then raised sufficiently to enable the spider tube and the support tubes to be refixed into the centre hub, the coax connected, the beam pruned if required and the tower raised.

In conclusion, without making any special claims about performance, it should be said that as a home made beam it works well; it is cheap, simple and non-critical to make. It has been variously described by certain individuals as a "bloody monster" and a "double damask dinner napkin" and no one so far, having seen it, has shown any inclination to make one. However this article will save me the effort of trying to describe it verbally on the air; more specifically, how it differs from a delta loop beam.

There are probably several ways it could be improved and made uni-directional if required: I should be delighted to enter into discussions with interested hams.

UPDATE YOUR FT101 - BRIGHTEN YOUR FRONT PANEL

Don Paice VK3ADP
21 Allister St., Mount Waverley, Vic. 3142

A deficiency on all early model FT101 transceivers which was recognised and rectified by Yaesu starting with the Model B was lack of indicator lights to show when the clarifier control is in the "on" position, and to a lesser extent, when the internal VFO is in use.

In particular, if the clarifier control is set such that the receive frequency is a few hundred cycles offset from the transmit frequency, it may well take a few overs before one wakes up that the other station is NOT off frequency!

LED indicators can be easily fitted to older model FT101s, the necessary connections being simple and quickly done. The clarifier indicator is wired to the socket for PB 1185 (regulator and calibrator board) while the internal VFO indicator is wired to the 6 volt supply point to the VFO box.

Prior to starting work it is suggested that the transceiver external case be removed together with some circuit boards to allow a little elbow room.

Case removal is self-evident and easily done. At this stage turn the pre-selector control fully anti-clockwise as a precaution against damage to the tuning slug

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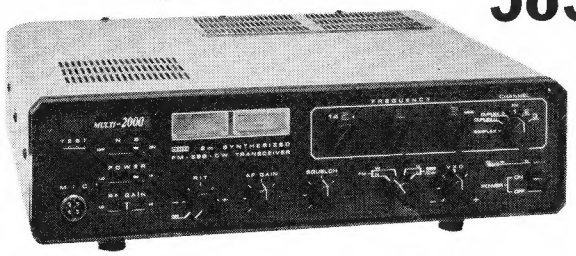

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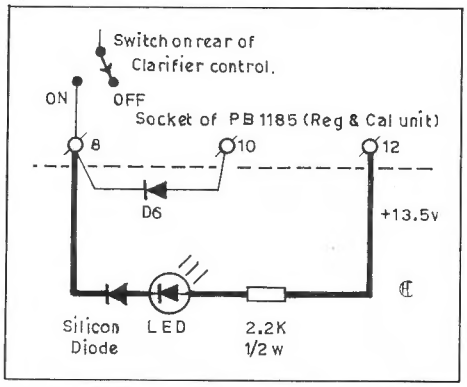


FT101 Clarifier Control Indicator (additional wiring in heavy lines)

mechanism. Temporary removal of the internal speaker is also a wise move.

CLARIFIER INDICATOR

Carefully drill a suitable hole through the front panel such that the selected LED will very neatly fit through from the rear side of the panel. Start with the smallest size drill you have and work up a drill size at a time.

A suitable location for the hole is about 6 mm or so to the left of the '2' calibration behind the clarifier control knob. Epoxy the LED into place from the rear of the panel — i.e. push the LED into the hole and dob some epoxy cement on the back.

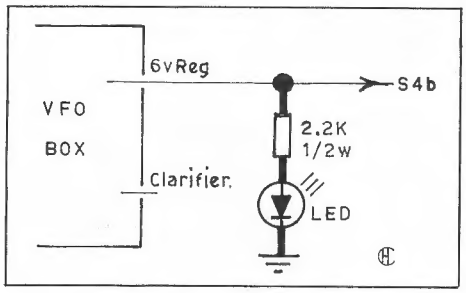
Circuit connections are as shown in the circuit diagram and are easily made. Some modification of the value of the series limiting resistor may be required dependent on the LED used. Physically, the one used was ⅛ inch diameter and about ¼ inch long.

The indicator LED will glow only when the clarifier circuitry is in use.

INTERNAL VFO INDICATOR

The ideal location for this indicator LED is just to the left of the 'INT' lettering at the internal/external VFO switch. It is necessary to remove the black plastic dial escutcheon — a task which appears far more formidable than doing it will be. Three screws hold the escutcheon in place and these must be removed from the rear of the front panel.

The escutcheon need not be completely removed — wiring to the meter control slider switch will prevent this but will allow enough movement for it to be swung out while a hole is drilled and the LED fitted. Before epoxying the LED into place attach 2 wires to it and bend the leads from the LED such that they will be parallel to the front panel after fitting the LED. The wires can conveniently be routed through an existing hole in the front panel used for the dial lamp wiring.



FT101 Internal VFO Indicator (additional wiring in heavy lines)

Replace the escutcheon and wire the LED as per the circuit diagram. Caution — do not forget the series limiting resistor.

On the FT101 modified the 6 volt connection to the VFO runs through a feed through capacitor (the one with a single blue wire) on the rear of the VFO box under the chassis. The wiring can be run in with other wiring in a loom.

Replace the circuit boards, test the modification, and then reassemble the ou transceiver case.

Additional current drain is negligible and is in the order of several milliamps.

Addition of these indicators will add to the ease of operation and thus operating pleasure when using an earlier model of this fine transceiver. ■

MODIFICATION OF FT101 TO ALLOW USE OF NORMAL SSB FILTER FOR CW OPERATION WHERE OPTIONAL CW FILTER IS FITTED

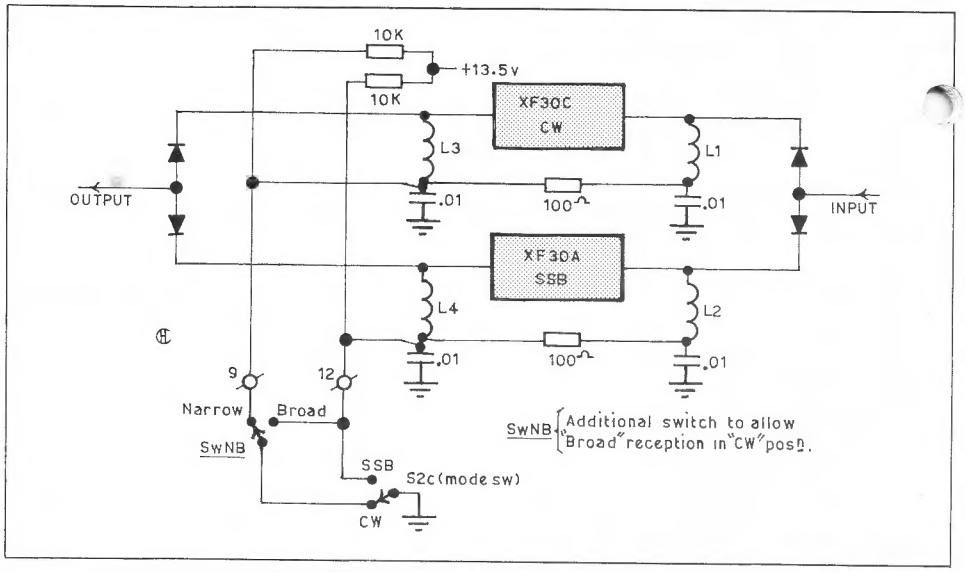
Don Paice VK3ADP
21 Allister St., Mount Waverley, Vic. 3142

The optional CW filter when fitted to the FT101 transceiver is excellent for use when copying CW signals on, say, 20 metres when the DX is coming in. However, the normal SSB filter is both adequate and desirable when quickly scanning the CW segments for signals, and for normal CW operating when signals are in the clear.

Reference to the FT101 circuit diagram will show that diode switching is used to change filters and, in effect, the appropriate filter is switched into use by earthing, via a segment on the 'mode' switch, either pin 9 (for CW filter) or pin 12 (normal SSB filter) on circuit board PB 1183 (filter board).

It is possible to manually switch from the CW filter to the SSB filter by use of the mode switch; however, the addition of a miniature SPDT switch will enable either filter to be used with the mode switch left permanently in the CW position for CW operation.

The additional switch can be installed between the mode switch and the audio gain control on the front panel with connections being made to the appropriate pins on the socket for circuit board PB 1183. While drilling the panel it is a wise precaution to remove the internal speaker to stop metal chips etc. being attracted to the speaker magnet.



FT101 Crystal Filter Circuit

The circuit diagram shows the appropriate connections for this worthwhile modification. ■

STARTING MOBILE OPERATION

Maurie Evered VK3AVO
13 Sage Street, Oakleigh, Vic.

This article describes the sequence of events that occurred when I decided to try mobile operation. If you are contemplating an attempt at this fascinating side of our hobby it could be of assistance to you.

My urge to try mobile operation started when the family acquired a caravan and this seemed an ideal opportunity to start my mobile career in earnest. I had previously operated mobile on the two metre FM bands from the Melbourne metropolitan area with an FT2FB and a gutter mounted quarter wave antenna, but of course we are spoiled here by the excellent coverage of the repeater VK3RML, and successful mobile operation from country or bush areas is a much stiffer test of your equipment.

The first question to be answered was on which bands to operate, HF, VHF or both. Mobile operation at VHF is no longer confined to "line of sight" operation because of the excellent system of two metre repeaters established around Australia by hard working repeater groups, and the choice of HF or VHF was not an easy one to answer. Either rig (FT101 or FT2FB) is admirably suited to mobile operation so it became largely a question of how to get the most for any money spent. I needed a mobile HF antenna and mounting system or a full complement of crystals to cover the full number of repeater and simplex channels. There was little difference in these two relative costs. In my case HF operation won out because —

1. It offered a greater range than VHF in Australia.
2. It eliminates the VHF "dead spots" that occur in mountainous country.
3. I wanted to try my hand at mobile DX operation on the higher HF bands.

This of course was a personal choice and is open to a lot of argument and discussion. My answer to "why not use both HF and VHF" is again personal —

1. Extra space is required to mount both rigs in the vehicle.
2. HF could do anything VHF could do as far as I was concerned.

The standard amateur text books and magazines devote a lot of space to the needs of the mobile operator and should be read as an introduction but you cannot beat local information. As usual my fellow Hams were ever ready to give helpful advice. What follows will be written under a series of headings for ease of presentation and reading.

CHOICE OF ANTENNA

The pros and cons of the different types of mobile aerials have been flogged for years in both the spoken and written word, and I will not prolong the argument here. If you wish to read further about this fascinating subject check the list of references given. I chose the MARK HW 3 because —

a. It enables operation on three amateur bands without coil changing. You merely change bands and retune your transmitter or transceiver.
b. It is of the "top loading coil" type of antenna providing an excellent current distribution on the radiating rod. I have always been impressed by the performance of this type of antenna particularly on 20 metres. I remember Harry VK3XI in particular. His signal from northern Queensland had to be heard to be believed.
c. The HW3 maintains a good SWR across the bands particularly on 20, 15 and 10 metres.

Details of this antenna can be seen in the accompanying photographs. The antenna was obtained from Bail Electronic Services.

HOW AND WHERE TO MOUNT THE ANTENNA

As I intended pulling a caravan and going off the beaten track certain popular sites for mounting an HF antenna were precluded —

a. Ski-bar type mounts — the antenna could easily be "wiped off" by low tree branches.
b. Rear bumper mount — the close proximity of the large mass of metal in the van causes severe detuning.

The choice became virtually automatic. On the front bumper of our HT Holden. When this spot was chosen one difficulty was immediately obvious. The bumper on this model sits very flush with the body and any rod mounted vertically from the bumper would certainly contact the metal of the bonnet. This difficulty was easily overcome by the use of a Hy-Gain BPR 415 mounting kit. This kit is a clever combination of bits and pieces that can be adapted to fit just about any type of bumper bar.

The final problem in this "section" was how best to route the coax cable from the

antenna mount to the operating position. Here I sought the advice of Don Paice VK3ADP, a very experienced and highly successful mobile operator on both HF and VHF.

We decided to run the coax from the bumper, through a convenient body hole, along the inside of the left mudguard (there are already clips here holding other wires and these clips can easily hold the coax as well) through a drilled and grometted hole in the firewall and so to the interior of the car.

This method means the coax cable runs inside the engine compartment and according to some mobile operators may pick up more interference than if run outside the compartment. This leads to our next topic of discussion.

HOW TO GET RID OF ELECTRICAL INTERFERENCE

In my case little difficulty was experienced as the noise blanker on the FT101 quietens ignition hash like magic (see AR February 1974 for full report). The only other suppression used was the fitting of "carbon" ignition leads; these are standard on this vehicle. Incidentally there are two little known facts about the type of lead —

It is most effective at frequencies well above the broadcast band, particularly at 40-50 MHz. You cannot judge the performance properly on your BC car receiver. (See Electronics Australia February 1968 p. 77).

These leads do not have an indefinite life and should be replaced every one to two years.

Suppression of vehicle noise is a very specialised subject and will only be briefly covered here. It always helps if you can get advice from someone who owns the same type of vehicle as you do. I suggest you try the following order —

Check that spark plugs are clean and properly gapped, and that ignition points are not badly pitted. Check too the distributor cap for cleanliness. These areas are often overlooked.

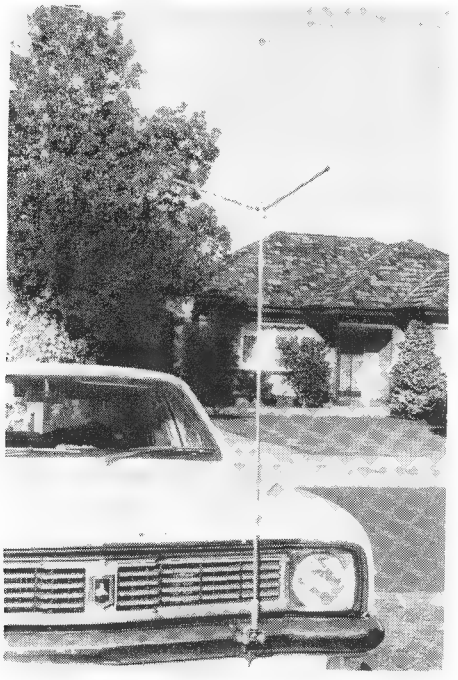
Install carbon type ignition leads.

Install a 0.5 uF capacitor from the SW terminal on the coil to a closely adjacent earth point.

Screen the HT lead from the coil to the distributor and the lead to each plug from the distributor.

Check the "continuity" of all metal parts — engine, chassis, exhaust pipe etc. When these are reliably bonded electrically the noise level often drops dramatically.

Now a brief coverage of other possible sources of electrical interference in your vehicle —



The Mark HW3 mounted on the front of Maurie's car.

BATTERY CHARGING COMPONENTS — GENERATOR, VOLTAGE REGULATOR OR ALTERNATOR

The car generator system can create an annoying whine in the receiver. This results from the brushes sparking as the commutator passes over them. Firstly clean or replace the brushes and clean the commutator surface. A coaxial feedthrough capacitor of 0.1-0.5 uF should be mounted on the generator frame and used to filter the generator armature lead. In very stubborn cases a parallel L/C circuit can be used here, tuned to the receiver operating frequency.

Voltage regulators contain relay contacts which jitter open and closed, creating a ragged and hashy sound in your receiver. Coaxial feedthrough capacitors are used to filter the battery and armature leads from the regulator box.

Alternators generally are less troublesome than generators and the same rules of suppression apply. A coaxial capacitor or tuned trap is connected to the alternator output lead. Do NOT connect a capacitor to the generator or alternator field terminals. An alternator suppression kit is available from advertisers.

WINDSCREEN WIPER OR HEATER MOTORS

Connect a 0.5-3.0 uF capacitor from the input terminal to earth.

FUEL GAUGE

Noise from this unit may be obvious if with the ignition on and the engine not running you bounce the rear of the vehicle (at the front of a Volkswagen) of course. Connect a 0.1 uF capacitor across the terminals of the tank unit.

HOW TO FIT UP THE FT101 FOR MOBILE OPERATION

This may seem a strange statement but two "additions" were made to the transceiver (see accompanying photographs). Firstly a Kyoritsu SWR meter was mounted in the rear left hand side of the lid. I removed the four rubber feet from the meter and used the same bolts and nuts to attach the meter to the FT101 through the slots in the lid. In this position it does not affect the cooling of the rig in any way, and the SWR meter is a must in any mobile antenna line for both tuning and monitoring relative output. It stays in position even when the rig is used at home base.

Secondly a morse key was attached to the lid (again see the photograph) after a strip of thin leather was stuck to the base of the key to prevent scratching the lid of the rig. As before use fine bolts and nuts through the slots in the lid.

I always remember Ken VK3GKs advice in this respect. CW is very useful when the going gets tough and signals are weak. Several CW contacts were made on 20 metres from the *stationary* vehicle.

The DC lead for the FT101 works best if connected as directly as possible to the car battery. I ran it through a hole in the firewall for a direct battery attachment. While on the subject of leads, remember to always take your 240 volt lead with you. It relieves the load on the battery when operating from a powered caravan site.

HOW AND WHERE TO MOUNT THE FT101

There is an excellent mobile mount available for the FT 101 (try Bail Electronic Services) that fits across the transmission hump but in my case the solution was much easier. The middle front seat (assuming three across the front seat) is always empty when we go bush and provided an excellent spot for the rig with no discomfort to passenger or driver.

It is secured in position by an elastic strap available from any motor accessory store. This passes through the seat belt hole in one direction and forward and under the seat in the other. There are plenty of anchor points available.

HOW DID IT ALL PERFORM?

So far most contacts have been made on the 80, 40 and 20 metre bands, as 15 and 10 are still in the doldrums at the time of writing. Many interstate contacts, including mobile to mobile have been made on 80 and 40 at strength up to S9 plus, but dependent of course on prevailing conditions. On 20 metres DX has been worked, particularly to ZL and W lands. Reports vary but a 5 x 5 was received from the USA. This is not a bad report considering the general state of 20 metres at prese

All that remains to complete the story are several very grateful acknowledgements.

1. Don Paice VK3ADP whose wealth of mobile operating knowledge was of great help in all aspects of the operation of setting up.
2. Lin Brown VK3ARL for helpful advice and testing, particularly on 80 metres.
3. To the many other VK's who willingly tolerated my requests for comments and signal reports.

REFERENCES

AMATEUR RADIO —

March 1975 p.5 — Vehicle Ignition Noise Suppression, by R. Champness VK3UG. (This article is the best article I have read on this subject.)

Jan. 1975 p. 17 — Ignition Noise Reduction, by G. Soines VK3AUI.

Jan. 1970 p.15 — One Way, by B. Warman VK5BI.

RSGB HANDBOOK, ARRL HANDBOOK — Appropriate Sections.

■

A REVIEW OF THE KYOKUTO DIGITAL PHASE LOCKED FM TRANSCEIVER

As we have mentioned in previous reviews in Amateur Radio, quite a few Japanese electronic companies specialising in commercial radio gear are turning their hands to limited amateur producton. One such firm is the Kyokuto Denshi Co. Ltd., of Tokyo. This firm specialises in the manufacture of aircraft radio equipment and it is thought that the transceiver to be reviewed is an adaptation of one such piece of gear.

The Kyokuto model FM144-10SXR 11 is a fully synthesised FM transceiver covering the entire two metre band from 144.0 MHz to 148.0 MHz in five kHz steps. As originally produced, they have receive capability over the above range and transmit capability from 146 to 148 MHz. However the Australian Distributors now include a modification which enables the rig to transmit and receive over the full two metre band. As we shall later see, it does this with excellent results. Measurements of the transceiver are 54 mm high, 165 mm wide and 195 mm deep, and the weight 2.1 kgs. This is about the same as other FM transceivers previously reviewed in the magazine.

Considering the compact size of the unit, a remarkable number of functions are included. The more important of these are: dial up frequency selection over the entire two metre band; LED digital readout of the frequency selected; provision for repeater operation with 600 kHz offset both up and down allowing normal or reverse mode. Transmitter power output is switchable to either ten or one watt with the actual switch located on the microphone. A total of 43 transistors, 21 IC's and innumerable diodes are employed in the fully solid state circuit. A mobile mounting bracket, mounting hardware, plus the usual connecting cable and spare fuses, are supplied with the set.

The Kyokuto is imported and distributed in Australia by Sideband Electronics Sales from their new location at 2 Kurri Street, Loftus, 2232, N.S.W.

KYOKUTO CIRCUIT DESCRIPTION

The heart of the Kyokuto transceiver is the frequency generation section made up with the VCO/PLL and decoder/display units. The voltage controlled oscillator (VCO) operates over a range of 127.1 to 132.09 MHz, the output feeding through two buffer stages and then to the receiver first mixer. The same output signal is also mixed down to a range of 4.00-8.99 MHz with the multiplied output of either of two crystal oscillators on 41.03166 or 41.03 MHz. The selection of these depends on whether the five kHz last digit switch has been operated or not.

The 4.00 to 8.99 signal is then entered into the programmable counter of the PLL unit. Three IC's count either of the 1 MHz, 100 kHz or 10 kHz orders which are then fed to a phase comparator. A front panel mounted LED indicates unlocked conditions.

A portion of this voltage is also used to control varicap diodes in the receiver front end to maintain peak performance over the whole four megahertz covered.

Six seven segment LED display units are controlled from the PLL unit. The first two digits are fixed on 1 and 4 respectively and the last digit is switched from 0 to 5 with the 5 kHz selector switch.

The receiver is the usual double conversion set up but with the first IF at 16.9 MHz instead of the more usual 10.7 MHz. The front end employs two dual gate FETs as RF and first mixer with varicap adjusted tuning between. Ceramic filters are provided at both 16.9 and at the second IF frequency of 455 kHz. Selectivity is rated at +/— 6 kHz at the 6 dB points and +/— 12 kHz at the 40 dB points. However should this degree of selectivity need to be changed, some fourteen optional filters are listed as being available from the manufacturer. These have band widths varying from +/— 4 kHz to +/— 17.5 kHz and are available in either 9 or 15 pole types.

Muting and audio circuits are of the conventional type and a 50 mm speaker is mounted on the bottom side of the cabinet. Provision is also provided to connect an external speaker via a 3.5 mm socket.

The transmitter line up commences with either one of three crystal frequencies. These are 17.5 MHz for repeater up, 16.9 MHz for simplex and 16.3 MHz for repeater down operation. The signal goes via a buffer stage to a balanced diode mixer where the output of the VCO is combined to produce the final transmit frequency. Six stages then bring the power up to the ten watt level. Transmit audio employs limiting and has a 12 dB per octave cut off above 3 kHz. This is one of the very few amateur FM transceivers that uses true frequency modulation and this is achieved with a varicap diode in the VCO unit.

Three power supply sections are included. One provides 9 volts for the receiver, and the second acts as over voltage protection for the transmitter final stages being set at a maximum of 14 volts. When low power is selected, this same regulator reduces the final voltage to any desired point. In fact the power can be adjusted from almost nothing right up to the full available output — a very handy feature if an exact amount of output is needed to drive an amplifier or to act as a reference. And finally the TTL circuits are provided with a regulated 5 volt line.

THE KYOKUTO ON THE AIR

After some years of using a normal channel switched FM transceiver on two metres and associating channel numbers with switch positions, it is a little strange to have to think in actual frequencies. On first acquaintance with the Kyokuto quite a bit of head scratching and consulting of old copies of Amateur Radio was indulged in. However like most things of this nature, it soon falls into place.

Let us look at the front panel and see how it all works. From the left is first the audio gain combined with a pull on, push off, power switch. Next is the squelch

control which also selects the 0 or 5 kHz last digit, also with a push pull action.

Third knob controls the selection of the MHz point. That is it selects either 144, 145, 146, 147 or 148. But again this control has another function. The sixth position selects a pre-arranged call channel. Full details are included in the instruction manual on how this can be set up on any frequency needed.

With the fourth knob we come to the main frequency selector. This is a dual concentric control with the larger rear section switching the 100 kHz points and the front section switching the 10 kHz points. So it is easy to see how a particular frequency is dialled up. Normally in Australia only the 146 MHz section will be used, so that all channels can be selected with the concentric knobs only.

To the right of the main frequency selector is a three position toggle switch which shifts the transmit frequency up or down 600 kHz in relation to the receive frequency for repeater operation. With the central position transmit and receive occurs on the same frequency for simplex working. A few points are worth noting in relation to the functioning of this control. Firstly only the transmit channel is shifted; if reverse repeater operation is required it is necessary to dial up the new receive frequency and then off-set the transmitter in the opposite direction.

Also with an up or down shift selected, no visual indication is given on the transceiver. In other words the digital readout still indicates the receive frequency.

On quite a few occasions I found that I was transmitting 600 kHz up or down when trying to work a simplex channel. It's a pity that some form of visual indicator is not provided.

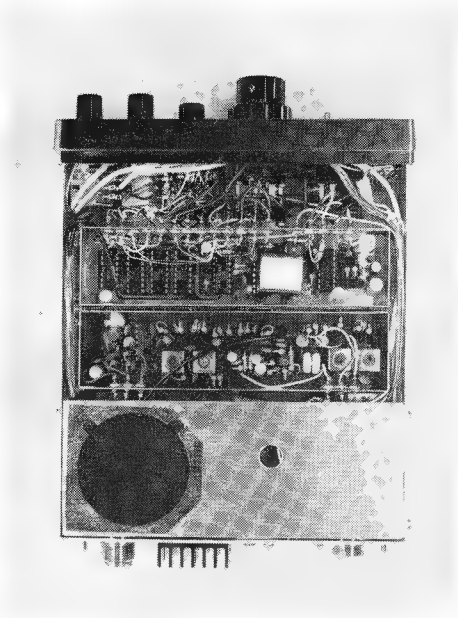
On the right hand side of the panel is a now standard four pin screw-on microphone connector and above this is the signal strength output meter. The meter is illuminated in a deep green colour. It looks very pretty but is not easy to read from a distance due to a lack of contrast.

Above the main channel selector knob are two LED indicators. The left hand one lights when the mute is opened either due to a signal coming up on the channel selected or to the squelch not being far enough advanced.

The right hand LED shows when the PLL is unlocked. The handbook states that the transmitter should not be operated if this occurs but omits to say what should be done to correct the trouble. However after many hours of operation no problems were experienced.

The digital LED frequency readout is very clear to read under normal lighting conditions but in common with all readouts of this type, it becomes impossible to read under strong light conditions.

Audio from received signals was clean and of good balanced quality so long as the station was not deviating beyond about 6 or 7 kHz. This is definitely a narrow band receiver, at its best with signals of 5 kHz deviation. .If wideband transmissions



Underneath view of the unit with the cover removed.

are common in your area, one of the wider filters specified in the manual might be more to your liking. However with the trend to narrower signals it's perhaps better to ask the other station to turn things down.

The transmitted audio was judged to be clean and well balanced. It appears after checking quite a few Japanese FM transceivers that manufacturers in that country have adopted a common audio characteristic for these rigs, so that in general they sound first rate to each other.

THE KYOKUTO ON TEST

Transmitter power output was first checked using a Horwood dummy load watt meter. With 14 volts applied from a well regulated bench supply the output at 146.5 MHz was 15 watts exactly. At 144.0 and 148.0 MHz the output had only dropped the meter reading to 12 watts. In the low power position the output was one watt; however as mentioned earlier this can be set to any figure required.

While these tests were in progress the current drain was measured. Receive only; 625 mA. Transmit low power (1 watt output) 2 amps. Transmit with full output 3.6 amps. In the receive mode with full audio output 800 mA peak.

This is of course a little more than normal FM transceivers. The increase is due to the additional circuitry associated with the synthesizer and digital readout. Receive sensitivity figures equalled the best so far achieved in our tests on FM equipment. They were:

Quieting at .5 uV —28 dB
1 uV —33 dB
Signal to noise ratio.
.5 uV —33 dB
1 uV —40 dB

The mute opened with a signal of about .1 uV.

Receive audio output is rated at 4 watts with 10% distortion. Checked with a steady tone, audible distortion was evident above 2 watts. However it is possible that peaks of audio would reach 4 watts with low distortion. In any event there is more than enough output to cope with even the noisiest location.

Transmit and receive frequencies were checked with an external counter and were found to be within about 500 Hz of the nominal frequency. It was a simple job to set them spot on. However, as the procedure is not covered in the instruction book and as suitable test gear is required, readers are warned against tweaking it up. The error involved is extremely small and would pass unnoticed in normal operation.

INSTRUCTION BOOK

The instruction book covers the basic operating procedures fairly well. There is also a section on the theory of operation of each section. Two photographs show the location of the preset controls; however there is no printed circuit layout or any details of adjustment of the frequency determining components.

CONCLUSION

The performance of the Kyokuto is first class in all respects and in fact could be almost considered the FM rig to end all FM rigs. While the initial cost is somewhat higher, it is the full cost in that you will never need to buy another crystal. You are also free to roam the wide open spaces that still exist on the two metre band and to set up private nets far from the ears of the operators with their switched channel sets.

Enquiries for the Kyokuto should be directed to Sideband Electronic Sales at P.O. Box 184, Sutherland, N.S.W. 2232. ■

BOOK REVIEW

MANUAL OF QUESTIONS AND ANSWERS FOR THE NOVICE LICENCE
by K. Howard VK2AKX
Second Edition. Published by the Westlakes Radio Club

A valiant effort has been hade to produce this manual which endeavours to provide all the necessary knowledge to pass the theory section of Novice Amateurs Operators Examination. And Ke. Howard has almost hit the bullseye with this shot. It is in general a useful and timely publication.

However there are one or two omissions which it is to be hoped will be remedied in the next edition. For example the section dealing with resistors does not discuss the color code system although this was the topic of a question in the March examination. The third edition will provide an opportunity to polish up and rectify the occasional ambiguous explanation and a few inaccuracies. To give one example, a simple rectifier voltmeter is claimed to indicate the RMS value. (Of course it indicates the average value but it may be calibrated to read RMS if the applied waveform, say a sinusoid, is always the same.)

One could of course find fault with the most professional publications and it would be unfair to say anything other than that for the most part this manual adequately explains the necessary theory. Even with the few blemishes noted it is well worth its modest price and at the moment it appears to have no peer or rival. VK3AFW

QSP

READERS OF AR

The Honorary Secretary of a well known amateur radio group recently wrote asking for a note to be included in AR about their forthcoming Convention. **The letter was addressed to the Victorian Division.**

AN AR SPECIAL

THE 1976 FEDERAL CONVENTION OF THE WIA

The 40th Federal Convention of the Institute was held in one of the Conference Rooms of the Diplomat Motor Inn in St. Kilda, Melbourne, from Friday, 7th May to Sunday, 9th May, 1976. The Federal President, Dr. David Wardlaw, VK3ADW, ably chaired the convention. All substantive members of Executive were present and took an active part in their own specialist areas; Mr. Keith Roget, VK3YQ on financial matters, Mr. Ken Seddon VK3ACS on repeater affairs and Mr. Peter Wolfenden, VK3ZPA on VHF/UHF policies.

DIVISIONAL REPRESENTATIVES

The Divisions were represented by their Federal Councillors as well as Alternate Federal Councillors in some cases. For VK1 Mr. Ed Penikis VK1VP, assisted by Mr. Neil Sandford, VK1ZT; for VK2 Mr. Tim Mills, VK2ZTM assisted once again by Mr. Geoff Cuthbert VK2ZHU; for VK3 Mr. Phil Fitzherbert VK3FF assisted by Mr. Peter Edwards, VK3ZZU; for VK4 Mr. Norm Wilson VK4NP assisted by Mr. Alex McDonald VK4TE; for VK5 once again the pair of Mr. Ian Hunt, VK5QX and Mr. Colin Hurst VK5HI; for VK6 and VK7 Messrs. Neil Penfold, VK6NE and Mr. Peter Frith, VK7PF respectively.

VISITORS

Mr. Jim Wilkinson, First Assistant Secretary as head of the Radio Frequency Management Division of the Posts and Telecommunications Department came along on the Saturday as an invited guest and answered numerous questions of interest to amateurs, especially relative to WARC '79 and amateur examinations.

Others who gave up time to attend and answer questions were Mr. Michael Owen, VK3KI, on IARU and WARC '79 matters, Mr. Peter Mill, VK3ZPP, assisting on repeater discussions, Mr. Bill Roper, VK3ARZ, on Publications questions, together with interesting comments from visitor Mr. Don McKay ZL3RW editor of Break-In, Mr. Alf Chandler, VK3LC, on Intruder Watch affairs, Mr. Ken Phillips, VK3AUQ, as Federal Contest Manager and last, but by no means least, Rev. Bob Guthberlet the Federal YRCS Co-ordinator.

This convention could be labelled "The Prayerful Convention" since it concluded with the following, specially composed for the occasion by Rev. Guthberlet —

"Almighty Father of the Universe,
we acknowledge with humility
the vastness of this universe
in which we have sought
to direct our thoughts
relative to using our technology
in expanding the means
of human communication.

Thank You
for making possible
a universal area
in which we can accomplish
a more effective fulfilment
of peaceful co-existence.

As we part
be near to us in our varied
journeyings that we may
continue our efforts to further
our aims in amateur radio.

Through Him who
communicated a wavelength
of philosophy as a guidance
for human relationships".

Amen".

ARNOLD REPORT

There were several areas of current prime importance discussed in depth at this Convention. The Report by Mr. Bob Arnold — see April AR — was too new on the scene for thoughts to be fully crystalised. More feedback from members is required to enable Divisional Councils to arrive at suitable conclusions before the end of the year. Meanwhile Executive was charged with the task of developing proposals for further work to be done on the report.

FM AND REPEATERS

A second area — in this case discussed at length in a Working Group outside the 32 hours of actual Convention sittings in the 57 available hours (inclusive of sleep and meal periods) — dealt with FM, generally, at VHF and UHF frequencies, including repeaters. In some specific areas additional work still remains to be carried out by the Federal Repeater Sub-Committee and the VHF/UHF Advisory Committee.

2 m REPEATERS

It was agreed that the 2 m FM repeaters should henceforward be designated and referred to by the input channel number. It will be remembered that channels in the 2 m amateur band are numbered 0 upwards every 50 kHz from 144.000 MHz. Hence channel 30 is 145.500 MHz (the beginning of the existing numbering system), channel 40 is 146.00 MHz and so on. Therefore the existing 2 m repeaters become known as 42 — or "2" if you drop the first digit — 146.100 MHz formerly Ch. 1), 43 (3) = 146.150 (Ch. 5), 44 (4) = 146.200 (old Ch. 2), 45 (5) = 146.250 (old Ch. 6), 46 (6) = 146.300 (old Ch. 3), 47 (7) = 146.350 (same as old Ch. 7), 48 (8) = 146.400 (old Ch. 4). The Department is to be approached to accept an amendment to the WIA 2 m band plan whereby 146.050 MHz (i.e. channel 41) be classified as the input frequency for a new repeater channel with its output on 146.650 MHz. It was agreed that the band 145.800 MHz to 146.000 MHz **inclusive** for other than approved satellite modes be actively discouraged.

70 CM BAND PLAN

The WIA 70 cm band plan (see March '76 AR p.4) came in for considerable scrutiny particularly because of the repeater windows required to be finalised for channels. In the process a number of amendments were made to the band plan itself and other items were referred back for further consideration. See AR August '75 p.7. The 440 to 441 MHz FM Simplex window is deleted and the experimental segment is enlarged to become 440-443 MHz.

70 CM REPEATERS

70 cm repeater inputs are in the segment 433-435 MHz with the outputs in the segment 438-440 MHz. In these segments channels, at 25 kHz points, are numbered corresponding to the frequency — thus, 433.025 MHz becomes channel 302 by dropping the first two digits and the last digit, 439.795 becomes channel 997, and so on for intermediate points. Repeater channels will have 5 MHz separation. Those channels, which are free from 2 m harmonic interference, designated as primary repeater channels are 352/852, those of the next priority are 322/822 and 367/867 and others are listed as 307/807, 337/837, 442/942, 457/957, 472/972 and 487/987.

70 CM SIMPLEX

The primary simplex FM frequency in the 70 cm band is 439.000 MHz (Ch. 900) and secondary frequencies are 438.825 (Ch. 882) and 439.125 (Ch. 912). The use of 438.000 MHz as an FM simplex channel is to be discouraged. All the 70 cm matters now require to be discussed with "Central Office" for approval.

EDUCATION AREA

Another Working Group was charged with examining the entire field of agenda items dealing with education, examinations, exemptions and YRCS.

It was agreed that the Executive should appoint a WIA member qualified to investigate and make recommendations (a) concerning instruction to candidates of all ages in the arts of radio communications (particularly amateur radio naturally) and (b) to correlate his findings to the nature and levels of examinations and possible exemptions therefrom.

It was indeed most unfortunate that the ideal person for this work passed away shortly after the Convention after having agreed to make a preliminary assessment. The YRCS obviously forms a part of these investigations especially as this movement nationally appears not to be in good health and many of those involved appeared, to many of the delegates, to have concentrated their energies on constitutional affairs in preference to teaching the young. Perhaps for this reason, among others, the Federal Council did not ratify the 1974 YRCS Constitution framed at Maitland. A three month period of grace has been given in respect of all previous YRCS constitutions. Agenda items aimed at lowering the age limits for Full and Limited licensees were not passed.

11 M BAND

At the 1975 Federal Convention it was agreed that guidelines were needed for amateurs using the 11 m band because of the numerous complications involved. At the 1976 Convention a set of guidelines was adopted and is published elsewhere in AR so that amateurs using this band may have some guidance. The nature of these guidelines were checked out by "Central Office" prior to the Convention.

As a result of adopting these guidelines the Federal Council promulgated a gentleman's agreement for all amateurs using the band, as follows —

26.960 — 27.030 MHz CW only
27.030 — 27.230 MHz Phone and CW.

WARC '79

"You are going to hear more and more about WARC '79" is the message from this Convention. Members who read WIANEWS regularly will have some idea of the work already being done by the WIA in the Australian Preparatory Group (APG) covering all the services in preparation for the formulation of the Australian Brief for this enormously important Conference.

Report on the visit overseas by the Federal President during April, the visit and work done by your IARU Liaison Officer (Mr. Michael Owen) and some of the thoughts of Mr. Jim Wilkinson were heard and discussed at some length during the Convention.

Nothing in the immediate future is of greater importance to the amateur service than WARC '79. The co-ordination work of the IARU for the amateur cause is well documented and tremendously advantageous to us in Australia. In the years ahead we need unity and increased membership to enable the Institute fully to play its part. These are the main messages.

FINANCES

A financial sub-committee is now operative. The Convention adopted a budget for 1976 which included an estimate of income based upon a very modest increase of 50 cents in the Federal element of subscriptions for 1977 subject to review by the end of August. Coupled with this, the subcommittee recommended that indexation principles should be applied to the Federal element of subscriptions based on the Consumer Price Index movements. If this had been applied during the past year it was calculated that a Federal element increase of $2.00 would have been justified. The Executive's financial situation was adjudged to be now in good shape in readiness for the tasks ahead of a routine nature.

NOVICE LICENCEES

The Convention agreed, after much discussion, that full membership is recommended as the appropriate grade for Novice Licencees subject to such Divisional Constitutional conditions as may be locally desirable. The condition was necessary because most of the Divisions are operating on a variation of the Uniform Divisional Constitution which required that Grade A (or full members) must possess or be of the equivalent standard, to AOCP.

It was also agreed to wind up the Novice Licence Investigation Committee set up in 1970/71 with grateful thanks to the Chairman and members for their work. A motion that the two year tenure for Novice Licences should be altered so that extensions of time could be granted in exceptional cases was withdrawn because the Institute already has this assurance.

GENERAL

The following were adopted —

- Negotiate for certain improved and expanded RTTY conditions;
- Examine the Amateur Advisory Committee situation;
- Seek extended broadcast times and conditions;
- Press for proper syllabuses for amateur exams;
- Adopt standardised FM bandwidths/deviations;
- Specify and adhere to WICEN spot frequencies;
- Encourage use of non-pollutant energy systems;
- Seek allocation of certain of the higher GHz frequency bands;
- Try again for Limited Licencees to use CW on 144 MHz up;
- Negotiate for 4 exams each year;
- Investigate wider advertising for joinlng the WIA;
- Negotiate for cross-band and also higher band ATV repeaters.

Space does not permit reporting on many other items discussed. A proposal that the RD Contest Trophy should remain in VK5 in perpetuity when that Division has won the Contest 6 times consecutively was not adopted but the Trophy does need a new base to accommodate more shields. It was in Darwin during Cyclone Tracey and was eventually unearthed bent and tarnished from underneath tons of rubble. The VK5 Division had it repaired and refurbished in gold plate so it has indeed some history behind it.

As usual contests and awards came up for some discussion but the principle was followed that if the appropriate Manager cannot resolve some problem or other he should refer it to Executive. Only if the Executive cannot reach a decision would the matter go before Federal Council.

The existing Executive was re-elected to office en bloc for 1976/77. ■

THE EXECUTIVE ANNUAL REPORT 1975

The Wireless Institute has just come through a very exacting period. As was mentioned in the last annual report of the Executive the massive inflation had put us in considerable financial difficulty and the matter was considered extensively by the last Convention. We decided that the only satisfactory way to handle the situation was for the Divisions to give the money to wipe out the deficiency that had arisen in the past. These contributions were to be on a pro rata basis. The Councillors made it clear that each Division would like to handle the matter in its own way. A time table was set and I am proud to say that all the contributions have been paid in full despite problems which arose in some Divisions.

As well as this the Council made some suggestions about the Federal Office which I will report on when dealing with that aspect of our activities. The Council decided that one of the past causes of financial problems was that the budget was set too far ahead of its actual implementation, and in 1975 it was decided to review the budget in September in order to give time to make any alteration, if it was needed, to change membership fees which had to be finalised by the end of October because of the computer deadline. This was done and it is to the credit of those who set the budget that no change had to be made.

The fact that at the moment we are out of our financial problem does not negate the point made last year that our present system is slow to react to the financial climate.

INVESTIGATOR'S REPORT

Bob Arnold VK3ZBB was chosen as the investigator to inquire into and report on the administrative, financial and constitutional organisation of the Institute in its whole and in its several parts. The report has been completed, circulated to the Federal Councillors, published in Amateur Radio and due for consideration at this Convention. I would like to thank Bob who made this report at no cost to the Institute.

EXAMINATIONS

During the last year the lengthy industrial dispute leading to the ban within the Department of Posts and Telecommunications on the conducting of all examinations led to a dearth of new licensees, a recruiting ground for new WIA members. These bans were an internal governmental problem, were a hardship to many and caused ill-feeling and loss of faith particularly amongst the potential novices. These views were conveyed to the Minister whose reply did little to comfort those waiting to take the examination. The bans were lifted earlier this year.

However the bans represented only one of the two examination problems as seen by the Executive — the other is the severe delay in marking papers and publishing results.

As the only exams conducted since the split-up of the Australian Post Office took place just prior to the writing of this report, it is impossible to tell whether there will be any improvement. However, taking the Government attitude to economies in staff into account it is hard to imagine that the situation will improve very much. The Institute has been investigating an alternative way to provide for exemptions for potential amateurs to hold station licences, or at least provide assistance in the conducting of exams.

THE EXECUTIVE

Keith Roget VK3YQ the Honorary Treasurer maintains his expert handling of financial affairs, keeping us well informed as to the situation at any given moment. Keith has also been able to speak with authority when matters concerning office routine or changes were considered. Jim Lloyd VK3CDR the Executive Vice-Chairman has been active in the WICEN area and also concerned with repeaters. Russell Kelly VK3NT who joined the Executive this year spent a considerable time investigating the EDP system with a view to increasing its usefulness to us. Unfortunately, Russell felt it necessary to resign due to a possible conflict of interest. He will however continue his work in relation to the EDP system. Ken Seddon VK3ACS has taken the Repeater Committee under his wing. Peter Wolfenden VK3ZPA has kept us well informed on VHF/UHF matters. Peter is the Chairman of the VHF/UHF Advisory Committee. Graeme Scott VK3ZR was co-opted to replace Russell Kelly until the 1976 Convention. Graeme is a teacher at the Box Hill Technical School and is a great help on the educational side. Also attending most of the Executive meetings were Bill Roper VK3ARZ the Editor of Amateur Radio and David Hull VK3ZDH the Chairman of Project Australis. Their expert advice was invaluable to us.

At this stage I would like to pay tribute to Peter Dodd our Secretary/Manager for the way in which he instigated economies in the office which were a distinct help at this time of financial problems. I would also like to thank Peter for his great help throughout the year both personally and on behalf of the Executive and Federal Council.

THE OFFICE

At the Convention several suggestions were made into possible changes in the office. On the 3rd July the Executive held a special meeting to look at these matters in depth and in the light of the facts and figures produced the Executive judged that the then existing employees were able to provide the best service at the most economical cost and that there would be the best back up in the case of illness. Colonel Perry volunteered to cut back his hours of attendance but was prepared to work more at a stage when the work load increased.

This year it is very pleasing to see the increased way in which Federal Councillors are participating in the "between Convention" affairs of the Institute, by using the Executive Office as a clearing house for the exchange of information and ideas. This will make the Federal Convention more meaningful as many subjects will already have been commented on in the correspondence which has been circulated around amongst the Councillors. It is also pleasing to see that a significant number of Agenda Items have been received in sufficient time to publish them in Amateur Radio.

POST OFFICE — DEPARTMENT OF POSTS AND TELECOMMUNICATIONS

Since the last Convention the split-up of the Australian Post Office has left the administration of amateur radio to the Radio Frequency Management Division of the Department of Posts and Telecommunications. We have been in constant communication with personnel of the Division on a number of important matters. There have been several meetings to discuss specific problems including one with the Permanent Secretary to the Department, Mr. Fred Green. The main topics discussed were WARC 1979 which is mentioned elsewhere, examinations, repeaters, Call Book, Novice licensing removal of the necessity for special television permits and radio teletype. We have always received a fair hearing and the main problem during the year was industrial action within the Department and the lack of staff.

WORLD ADMINISTRATIVE RADIO CONFERENCE GENERAL — 1979

In October information was received from the Postmaster-General's Department anticipating the formation of a preparatory group. The WIA was later invited by letter to attend the first preparatory group meeting on 25th February. The draft terms of reference were:

(1) To prepare and submit Australian proposals for the World Administrative Radio Conference 1979;

(2) To develop Australia's attitude to proposals of other administrations;

(3) To recommend an overall Australian position including alternative positions for the work of the Conference for inclusion in the Australian brief for the Conference;

(4) To make recommendations on the composition of the Australian delegation;

(5) To establish committees to serve the needs of particular services and to appoint chairmen and vice-chairmen of these committees.

Dr. David Wardlaw attended on behalf of the WIA. The Amateur Service and the Amateur Satellite Service was to be studied by Committee No. 2, chaired by the WIA. It is to be noted that this is a committee of the Australian preparatory group for WARC general 1979 and naturally will be receiving submissions from all amateurs on matters relating to the amateur service and amateur satellite service which will be under consideration at WARC general 1979.

The WIA nominated Dr. David Wardlaw as chairman and a preliminary meeting was held on the 5th April which will report to the second meeting of the Australian preparatory group due to be held on the 28th April. The other six committees cover aeronautical, broadcasting, maritime, space, radio determination and a composite committee for the fixed mobile safety standard frequency and special services.

IARU

There has been considerable activity on the IARU front this past year with the distribution of the reports of the meetings of both Region 1 and Region 3. Also IARU headquarters is sending monthly WARC 1979 newsletters to all societies to keep them informed as to what is happening throughout the world. The Region 3 news produced by the JARL has reached us and has been distributed to the Divisions.

Following the Region 2 conference in Miami, Noel Eaton VK3CJ President of the IARU has called a World IARU Conference to discuss WARC 1979 in all its facets. The vital importance of this conference became apparent to the WIA especially at this stage of our own WARC 1979 domestic preparations and so it was decided that the President should attend in Miami, the expenses being a charge on the ITU fund. A further report will be given at the Convention.

ADVANCED AMATEUR COMMUNICATION EQUIPMENT FROM A WORLD LEADER — YAESU

YAESU

bail

Bail Electronics Staff at your service — *Left to right*

Fred Swart
Greg Whiter
Fred Bail
Jim Bail
Brian Stephens
Also part-time staff not shown:
Ken Jane
Alan Angwin

FT-101E TRANSCEIVER: 160-10 Mx, SSB, AM, CW, PA two x 6JS6C, 260W PEP input SSB. Built-in dual AC/DC power supply. BUILT-IN RF SPEECH PROCESSOR. Solid state except for Tx. PA and driver. IF noise blanker, FET Rx RF clarifier, built-in speaker. Export mod. 240V AC, 12V DC, inc. 160 & 11m. **$698.**

FT-101EE: Same as above, but without speech processor. **$649.**

FT-101 SPEECH PROCESSOR unit, includes fix ch. osc. **$70.**

M-101 MOBILE MOUNT for FT-101E. **$26.**

FT-200 TRANSCEIVER: 80-10 Mx, PA two x 6JS6C, 260W peak input SSB. Manual, PTT or VOX control, offset tuning, calibrator, operates from a separate power supply. **FP-200:** Yaesu AC power supply for FT-200, in matching cabinet with built-in speaker. Power supply and transceiver. **$468.**

FT-75B TRANSCEIVER: SSB and CW. VXO, noise blanker, squelch. Very small size, transistorised valve PA, a superb little rig. 80W PEP. Microphone and five crystals included. **$295.**

FT-75BS: Same as above, but low power for Novice use. Includes three crystals, 3565, 21175 and 27125 kHz. **$276.**

FP-75B/BS AC POWER SUPPLY: 230V for FT-75B/BS. Built-in speaker, power cable and plug. **$74.**

DC-75B/BS DC POWER SUPPLY: 12V for FT-75B/BS. Includes built-in speaker, mobile mount, power cable and plug. **$80.**

FL-101 TRANSMITTER: Solid state 160-10m, PA two 6JS6C, all facilities. Companion unit to FR-101. **$515.**

FL-101 SPEECH PROCESSOR: For installation in the FL-101. **$62.75.**

FRG-7 WADLEY LOOP RECEIVER: All solid state, 0.5-29.9 MHz in thirty 1MHz bands. Electronic band selection. **$259.**

FR-101D RECEIVER: All solid state, 23 bands inc. all amateur bands 160-10m plus 6 and 2m, FM, CW, etc., etc. **$723.**

FR-101D DIGITAL: Has all the options of the FR-101D as well as DIGITAL READOUT. **$889.**

FR-160 FIXED CHANNEL MARINE and AMATEUR RECEIVER: 12ch. (6ch. AM, 6ch. SSB.) 1.6-4.5 MHz SSB/AM. 240V AC, 12V DC, built-in spkr. **$189 plus Crystals.**

FT-501 DIGITAL READOUT TRANSCEIVER: 80-10m, SSB CW. 500W peak input, includes 2-speed cooling fan, noise blanker, clarifier, VOX and etc. Inc. matching AC PS. **$865.**

FL-2100B LINEAR AMPLIFIER: 80-10Mx, uses 2x572B triodes in G.G., twin fan cooled, styled to match FT-101E. **$435.**

FT-620B SIX METRE SSB AM, CW, TRANSCEIVER: 10W solid state, inc. calibrator and AM filter. **$475.**

FT-221 TWO METRE TRANSCEIVER: Features all mode operation — SSB/FM/CW/AM — with repeater offset capability. 144-148 MHz coverage using advanced phase-locked loop circutry. **$595.**

M-620/221 MOBILE MOUNT for FT-620B and FT-221. **$26.**

S200R TWO METRE SYNTHESISED FM TRANSCEIVER: 200 channels, 10W solid state. Simplex, repeater, and priority channel facilities. **$435.**

FP-2 AC POWER SUPPLY suitable for use with FT-224, S-200R, etc. 240V AC in, 12V DC 2A out, with built-in speaker and charger. **$69.**

FTV-650B SIX METRE TRANSVERTER: Converts 28 MHz. SSB to VHF, and includes receiving converter. 50W PEP. Primarily designed for coupling with Yaesu transmitters and transceivers. **$195.**

FTV-250B TWO METRE TRANSVERTER: Similar FTV-650B. 10W-15W output, but all solid state and built-in AC PS. **$230.**

FT-224 TWO METRE TRANSCEIVER: 10W, 23 Channels, plus one priority channel, direct frequency readout. Includes 40, 50 & 51, plus one rptr. (Other rptrs. available at $9.00 per ch.) **$199.**

FT-2 AUTO FM TRANSCEIVER: Similar to FT-224, but with addition of automatic scanning facility, etc. Includes B, 50 and one repeater channel. **$398.**

M-2 AUTO MOBILE MOUNT, for FT-2 Auto. **$15.**

YC-355D FREQUENCY COUNTER: 200 MHz. **$259.**

YO-100 MONITORSCOPE: Matches the FT-101E, but can be used with other Yaesu equipment. (IF kits 455 kHz and 9 MHz optional extra). **$199.**

YP-150 DUMMY LOAD/POWER METER: For use over the frequency range 1.8-200 MHz. Three power ranges, 0-6W, 0.30W, 0-150W with built-in cooling fan. **$88.50.**

FF-50DX 3-SECTION LOW PASS FILTER for TVI reduction. **$29.50.**

F-101 FAN. $35.

SP-101 MATCHING EXTERNAL SPEAKERS for FT-101, FR-101, FRG-7. **$38.**

ES FROM BAIL ELECTRONICS

SCALAR

NTENNAS HI-MOUND

KW

SR

hy-gain

VHF ANTENNAS

23, 3-element 2m Beam	$18.00
28, 8-element 2m Beam	$38.00
215B 15-element 2m super-beam	$69.00
GPG-2 2m ⅝ wave ground-plane	$27.50
64B 4-element 6m beam	$48.00
66B 6-element 6m beam	$79.00
VS-6GH 6 metre ⅝ wave G.P.	$28.00
ARX-2 three half wave 6dB gamma loop matched vertical	$39.00
ARX-450, 435-450 MHz three half wave 6dB Ringo	$36.00
AR-6, 6m ½ wave Ringo 3.75 dB	$36.00
A144-7, 7-element 2m Beam	$25.00
A144-11, 11-element 2m Beam	$35.00
A144-20T, 20-element 2m "Twist" Beam	$72.00
A50-3, 3-element 6m Beam	$37.00
A50-5, 5-element 6m Beam	$57.00
A430-11, 11-element 430 MHz Beam	$25.00

VHF MOBILE ANTENNAS

265 ⅝ wave Magmount for 2m, inc. co-ax	$41.00
270 Double stacked ⅝-wave fibreglass whip for 2m	$45.00
271 Mount for 270	$6.00
AS-2HR, ⅝-wave SS 2m gutter mount, inc. co-ax	$35.00
AS-2P40 as above, but fibreglass whip	$37.00
AS-2HRF ⅝-wave cowl mount type	$42.00
AS-6RD 6m centre loaded SS whip with gutter mount	$19.00

STANDARD VHF TRANSCEIVERS

SR-C146A, 2m hand held 5 chan. 2W transceiver, inc. carrying case and 4 chns	$159.00
SR-C432A, 70cm hand held 6 chan. 2W transceiver, inc. carrying case and 1 chn (435 MHz)	$199.00
SR-C430 70cm 12 chan. 10 watt mobile transceiver inc. 1 ch (435 MHz)	$295.00

STANDARD ACCESSORIES

CMP08 Hand mic. for SR-C146A and SR-C432	$18.50
CAT08 Rubber antenna (helical) for SR-C146A	$8.00
Heavy Duty Carrying Case for hand held units	$13.50
AC Adapter and charger for hand held units	$36.00
Mobile Adapter for hand held units	$11.50
Charger only	$9.00

BALUNS

HY GAIN

BN-86, broand-band ferrite Balun, 2 kW for Beams and Doublets	$25.00

ROTATORS

CDR

Ham II, 230 V AC	$189.50
CD-44 Medium duty rotator, 230V	$128.00
AR-22L Light, low cost rotator, 230 V	$65.00
Cable, 8 Conductor, for Ham II CD-44 (with rotator purchase)	**75 cents** yd.

ANTENNA ACCESSORIES

HY GAIN

LA-1, Lightning Arrestor, for installation in standard 52 or 72 co-axial feedline, designed to Mil. specs.	$39.00
LA-2, smaller size co-ax arrestor	$8.75
KW TVI filter 5 Section, SO-239 connectors. A superior job with excellent attenuation	$48.00

Q CRAFT

Porcelain Egg insulators	**50 cents**
WIDE RANGE of Co-axial cable and connectors in stock. K-20 70 ohm Twin feeder	**27 cents** per yd.

KW ELECTRONICS

Multi-band dipole traps with ceramic "T" centre insulator, 80-10m bands per pair complete with insulator	$26.50
Co-axial cable switch, 3 positions	$24.00

B & W

Co-axial cable switches, 5 position, Model 590G	$29.00

SWR METERS AND DUMMY LOADS

Q CRAFT

SWFS-2, single meter type, combined SWR and FS meter, 50 ohms, inc. FS pick-up whip, size 5" x 2" x 2¼". 3-150 MHz, UHF connectors — $16.50

SWR-2, dual meters, 50 ohms. Simultaneous reading of forward and reflected power, 5' x 2" x 2¼". 3-150 MHz, UHF connectors — $24.00

SWR-200 large dual meters, switched 50-75 ohms, with calibration chart for direct power readings to 2 kW in three ranges. A very elegant instrument. 7⅝" x 2¾" x 3¾" — $54.00

FS-600A Peak Reading Wattmeter SWR meter 20, 200, 500 and 1000 watts 230 VAC operation. 3.5-30 MHz, very accurate — $57.00

FS-301 Wattmeter/SWR meter 20, 200 and 1000 watts 3.5-30 MHz — $38.00

KW ELECTRONICS

Z Match Antenna Couplers, 80 metres to 10 metres. Beautifully finished in communication grey (see review "QST" July, 1972):—

KW E-Zee Match, screw terminals at rear, size 5½" x 6" x 12" — $76.50

KW-107 Supermatch, as above with addition of SWR meter, power meter with large 50 ohm dummy load to read up to 1 kW PEP, UHF sockets at rear. A superb piece of equipment, 7" x 8" x 13" — $209.00

KW-109 High power version of KW-107, larger condensers and coils — $245.00

KW-103 SWR Power Meter uses toroidal coil pick-up for continuous operation 52 ohms 1 kW max. to 30 MHz SO239 UHF sockets very accurate — $55.00

HEATH KIT

HN31 Cantenna Kit 1 kW oil cooled (oil not included) — $33.00

OTHER ACCESSORIES

EKM-1A Audio Morse CP Osc with speaker, one transistor, and tone control, requires one UM3 cell, in metal case 3⅝" x 2½" x 1⅛" — $10.95

TC-701 Morse Practice Osc. with built-in key and spkr. Inc. battery and auxiliary earpiece. Copy of morse code on case. Two can be wired together to form a practice communication set — $16.50

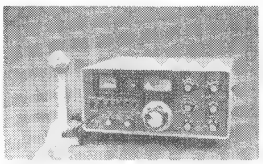
MC-701 Mic. Compressor, battery operated. Available with 4 pin mic. connector — $45.00

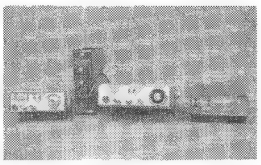
MORSE KEYS

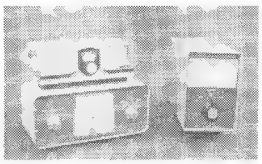
EK-108A Electronic keyer, super quality, IC with dot memory. Built-in monitor & paddle. Solid state "relay". 230 V AC — $79.50

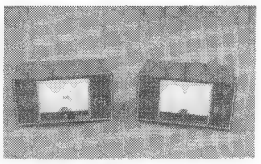
EK-108D, DC, same as EK108A but takes 2 size 'D' cells — $72.00

bail









LARGE RANGE OF ACCESSO

YAESU

SAHI ANTENNA

HIDAKA HIDAKA

Cush Craft

OPTIONAL CRYSTAL FILTERS. (Inc. CW & AM filters for FT-101). **$55.**

MATCHING VFOs: FV-101B, FV-200, each **$120.**

YC-601 DIGITAL READOUT ADAPTOR for FT-101E, inc. built-in AC PS. **$189.**

YD-844 DESK MICROPHONE: Yaesu De Luxe PTT Dynamic type with stand, spring and lock PTT switches. PTT also actuated when lifted from deck. **$39.50.**

RS SERIES HF GUTTER MOUNT MOBILE ANTENNAS: RS Base and Mast (doubles as ¼ wave on 2m). **$16.00.** Coil and Tip Rods: RSL-3•5, **$16.00.** RSL-7, **$14.00.** RSL-14, **$13.00.** RSL21, **$12.** RSL-27/28, **$11.**

As the sole authorised Yaesu agent and factory representative for Australia, we provide presales checking of sets, after-sales services, spares availability and 90-day warranty.

Quote type and serial number of set when ordering spares. All prices include sales tax. Freight is extra. Prices and specifications subject to change without notice. Allow 50c per $100 for insurance.

ANTENNAS AND ANTENNA ACCESSORIES

HF MONOBANDERS

204BA, 4 element 20m. Beam	**$194.00**
203BA, 3 element 20m. Beam	**$168.00**
VS-20CL 3 elem. W.S. 20m beam, **inc. Balun**	**$154.50**

HF DUO BAND

VS-22 3 element 15-11/10m, **inc. Balun**	**$118.00**

HF TRIBAND BEAMS

TH6DXX, 6-element trap Beam	**$248.00**
TH3Mk3, 3-element trap Beam	**$199.00**
TH3Jr, 3-element trap Beam	**$146.50**
HY-QUAD 2 element Quad Beam	**$225.00**
VS-33 (Equiv. TH3Mk3), **inc. Balun**	**$179.00**

NOVICE BEAMS

CB-3 3-element 11m	**$49.50**
CB-5 5-element 11m	**$68.90**
Long John 5-element (wide spaced) 11m	**$92.75**
Eliminator II, 2-element Quad. Sw'ble polarisation, 11m	**$89.00**
Big Gun II, 4-element Quad. Sw'ble polarisation, 11m	**$185.00**
SDB-6 Stacked 6-el Beam (3 + 3)	**$128.00**

HF VERTICALS

VS41/80KR 10m thru 80m, inc. 11m	**$80.00**
14AVQ, 10m thru 40m trap Vertical	**$69.00**
18AVT, 10m thru 80m trap Vertical	**$98.00**
12AVQ, 10m thru 20 m trap Vertical	**$50.00**
18V 10m thru 80m base loaded Vertical	**$39.00**
18HT 10m thru 80m Tower	**$275.00**
VS-RG Radial Kit for VS-41/80KR	**$22.50**
Golden CLR-2 ⅝ wave, 11m heavy duty G.P. 4 dB	**$63.70**
CLR-2 ⅝ wave, 11m G.P.	**$48.00**
GPGP ¼ wave, 1m G.P.	**$24.00**
GOLDEN ROD ½ wave, 11m 3.75 dB	**$37.00**
CR-1 ½ wave Ringo, 11m 3.75 dB	**$43.00**
HOPE-10GP. 10/11 metre helical groundplane	**$64.00**

HF MOBILE WHIPS AND FITTINGS

HY-GAIN & ASAHI MOBILE ANTENNAS

HELL CAT 3 35'' Magnetic base, 11m	**$33.00**
AQUA CAT 108'' Marine, 11m (no ground plane req'd.)	**$69.00**
HELL CAT 9, 58'' Marine (no ground plane req'd.), 11m	**$36.50**
W-102 102'' S.S. Whip	**$15.55**
HOPE-10R 10/11 metre adjustable gutter mounted helical inc. cable and connector	**$38.00**
HOPE-10B 10/11 metre adjustable helical equipped with ball mount and spring	**$35.00**
THUNDERSTICK 108'' fibreglass whip	**$19.00**
SUPER STICK similar to Thunder Stick, but double section	**$21.00**
GUTTER CLIP for whip tops	**$2.20**
HOPE-15R 15 metre adjustable gutter mounted helical incl. co-ax and connector	**$39.00**
HOPE-IORE 10/11 metre whip top only (as used in Hope-10R)	**$23.00**
HOPE-15RE 15 metre whip top only (as used in HOPE-15R)	**$26.00**
CIT-1H 10/11 metre base loaded, boot or rooftop mount, incl. co-ax and plug	**$19.95**
CIT-2H 10/11 metre centre loaded gutter mounted whip, incl. co-ax and plug	**$19.95**
AS-303 HF Mobile antenna set, centre loaded, incl. heavy duty ball mount and spring	**$108.00**
AS-NK matching S.S. Bumper Mount for AS-303	**$14.00**
VS-6GH 6 metre ⅝ wave ground plane	**$28.00**
AS-2DW 2 metre ¼ wave gutter mounted whip incl. co-ax and connector	**$23.00**
HOPE-2R 2 metre gutter mounted helical, only 22 cms long, incl. co-ax 2 connector	**$32.00**
VS-TOWN 2 metre flexable gutter mounted helical	**$15.00**
HU-2HR 2 metre Hidaka ⅝ wave gutter mount incl. co-ax and connector	**$35.00**

SCALAR MOBILE WHIPS

M-22T ¼ wave 2m whip top	**$5.95**
M-25T ⅝ wave 2m whip top	**$15.00**
M27-R60T 5ft. 11m C.L. whip top	**$19.45**
M-35T 4.5 dB Gain, 435 MHz S.S. whip top with spring	**$18.00**
M.B. Standard base	**$4.20**
MB UHF base	**$5.25**
MAGBASE inc. 12ft. of RG-58/AU	**$37.95**

MARK MOBILE

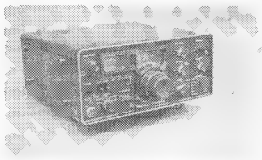
Helical:

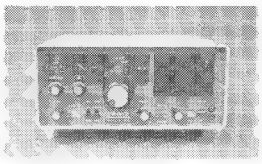
HW-80-8 80m, 8 ft	**$39.00**	HW-15, 15m, 4ft.	**$18.00**
HW-80, 80m, 6ft.	**$25.00**	HW-11, 11m, 4ft.	**$18.00**
HW-40, 40m, 6ft.	**$23.00**	HW-11, 11m, 6ft.	**$19.00**
HW-20, 20m, 6ft.	**$19.00**	HW-10, 10m, 4ft.	**$18.00**

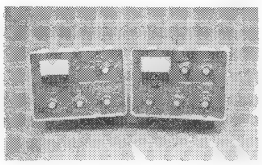
FITTINGS: (Suit all makes with ⅜'' x 24 thread).

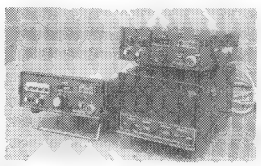
BPR, bumper mount	**$15.00**
BDYF, heavy duty adjustable body mount	**$15.00**
HWM-1, fixed body mount	**$14.00**
SPG, heavy duty spring	**$11.00**
SPGM, light duty miniature spring	**$6.00**
Asahi AS-KRB, flat roof mounting adapter for vertical trap antennas	**$15.00**
VS-BM Ball Mount & Spring	**$18.00**

bail









YAESU AMATEUR EQUIPMENT

HI-MOUND

HK-710 De luxe heavy duty morse key. Heavy base. A really beautifully constructed and finished unit. Fitted with a dust cover, standard knob and knob plate **$29.50**

HK-708 Economy key, all black ABS resin base and chromed mechanism **$9.95**

HK-707, Similar to above but with dust cover and standard knob **$15.00**

HK-808, Commercial hand key with ball race pivots, heavy poly marble base and plastic dust cover **$45.00**

MK-701 Side Swiper key to actuate an Electronic keyer .. **$29.50**

BK-100 (BUG) Semi-automatic bug key, full adjustable **$38.50**

MONITOR RECEIVERS

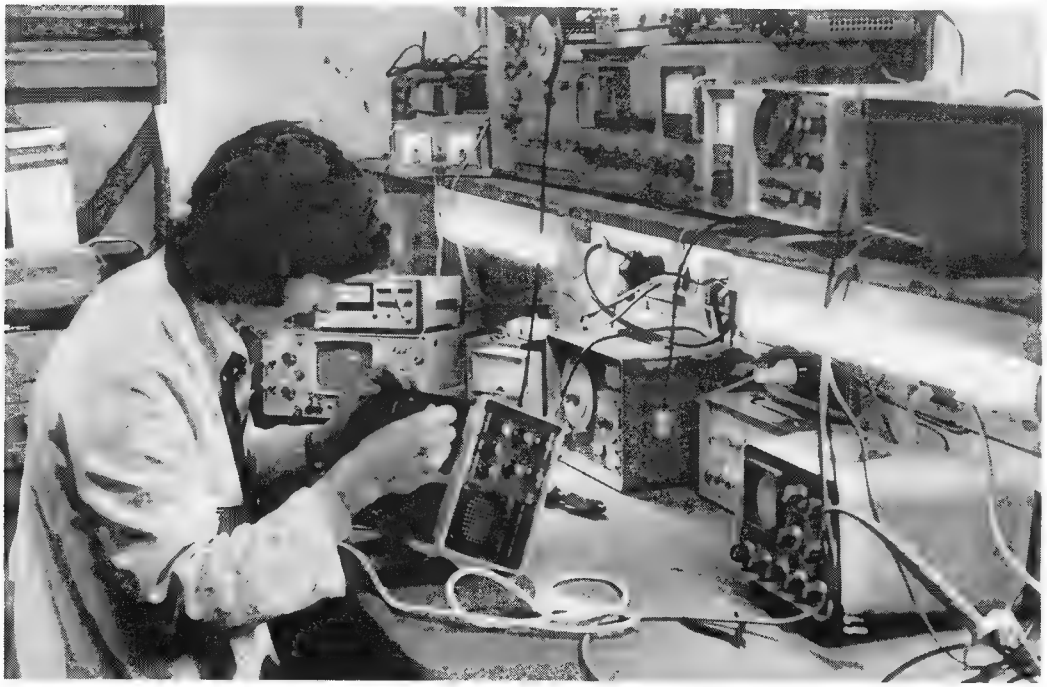
SC101, Automatic scanning receiver, 4 VHF chns., 4 UHF chns. RF stages, tuned to 146 and 435 MHz **$135,** Xtals extra.

MR-2, Mini Monitor. 12 ch. pocket receiver VHF. **$100,** Xtals extra

Also available: equipment for novice and Marine use on 11m band. Antennas, beams, Walkie Talkies, base stations, and accessories. Digital clocks, SSTV, Generator noise filters.

Servicing facilities for all types of Amateur and Novice equipment. We check all sets before sale and provide a 90 day warranty.

All prices incl. S.T. Postage and freight extra. Add Ins., 50c per $100. Prices and specifications subject to change without notice. Availability depends on stock position at time of ordering.



A fully equipped workshop provides prompt attention to your service requirements and full pre-delivery checking of transceivers, etc. Pictured *Left* is Greg Whiter, workshop manager who is assisted by Fred Swart, technician, and Brian Stephens, workshop assistant and despatch.

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JIM BAIL VK3ABA

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S.A.	FARMERS RADIO PTY. LTD., 20 Stanley St., Plympton, 5038	Ph. 293 2155
TAS.	G.T. ELECTRONICS, 131 Westbury Rd., South Launceston, 7200	Ph. 44 4773
N.S.W.	Aviation Tooling, STEPHEN KUHL, 104 Robey St., Mascot, 2020	Ph. 667 1650, AH 371 5445
	Amateur & Novice Comm. Supplies, W. E. BRODIE, 23 Dalray Street, Seven Hills, 2147	Ph. 624 2691
	DIGITRONICS, 186 Parry St., Newcastle West, 2302	Ph. 69 2040
QLD.	H. C. BARLOW, 82 Charles St., Aitkenvale, Townsville, 4814	Ph. 79 8179
	MITCHELL RADIO CO., 59 Albion Rd., Albion, 4010	Ph. 57 6830
A.C.T.	QUICKTRONIC, Jim Bland, Shop 11, Altree Crt., Phillip, 2606.	Ph. 81 2824, 82 2864

JAS7576-24

RTTY

At the last convention restrictions on amateur RTTY transmissions were discussed with a view to having them liberalised. The Executive referred the matter to the AARTG who have produced a report on which to base our submissions on desirable changes to the amateur regulations. Already preliminary discussions have taken place. The main points of the report are as follows:

(a) A suggestion for a relaxation but not elimination of the contentious issue of CW identification by RTTY operators.

(b) A choice of two codes is specified — approval of ASCII would open the way for the amateur service to make use of the ASCII coded equipment as used in the computer industry. The codes are — the 5 unit teleprinter code corresponding to international telegraph alphabet No. 2, and the 8 unit American standard code for information exchange, i.e. ASCII. It is also felt that subject to special application other coding methods should be permitted.

CALL BOOK

This year the Call Book was produced by the Hunter Branch in order to decentralise the workload from Melbourne, and our grateful thanks go to them for the job. The Publications Committee has suggested that the next Call Book should be produced from the computer printout, and the Executive has endorsed their suggestion. The best method to use our computer files for the purpose is under investigation at the moment.

MAGAZINE AMATEUR RADIO

During the year Bill Roper VK3ARZ and the Publications Committee have maintained the high standard — the December issue being a mammoth 60 pages. As you will see from the financial report we have been able to keep printing within budget; however postal charges are taking a larger and larger slice of the amount required to get "Amateur Radio" to the members. Alternative methods of distribution have been suggested by some members but at the moment no feasible alternative to the mail can be seen as our membership is so diversely scattered. The current cost of postage alone for AR works out at about $1.20 per member per year.

REPEATERS

There has been an exchange of ideas between the Institute and the Ministry of Posts and Telecommunications on the formulation of a revised set of conditions for the operation of repeaters which is to be applied on a national basis. Since VK5 relinquished the Federal Repeater Committee an ad-hoc Executive Repeater Sub-Committee has been set up in Melbourne with Ken Seddon VK3ACS, an Executive member, as chairman. Matters being considered are — the draft conditions already mentioned, the need for additional 2 metre repeater channels as the seven already allocated appear insufficient in certain geographic areas and the 70 cm repeater channels.

INTRUDER WATCH

During the year Alf Chandler, VK3LC and Ivor Stafford, VK3XB who acted in Alf's place while he was overseas, raised the question of the effectiveness of amateur reports. The matter was referred further by Executive and as a consequence the Intruder Watch reporting stationery has been redesigned to fit in with departmental requirements. Alf has been appointed the Region 3 Intruder Watch Co-ordinator and this gives him great scope to carry on with his liaison with Regions 1 and 2.

WICEN

At the last Convention the ACT Division offered to provide a Federal WICEN Co-ordinating Committee. This has been done with Rex Roseblade VK1QJ as the Co-ordinator. Rex has made contact with the National Disaster Organisation and has brought the amateur's worth in emergencies to their notice. The Executive Vice-President on behalf of the Executive also made a personal call on Major-General Stretton, Director-General NDO.

PROJECT AUSTRALIS

During the year the Australis group has been mainly concerned with planning for further satellites and it is pleasing to note that Australia is considered one of the major countries as far as the Amateur Satellite Service is concerned.

To all our co-opted officers I would like to express my own thanks and also on behalf of all the members. Furthermore, I would like to add my personal thanks to the members of Executive for their help during the year.

ATTENDANCE

The following is a statement of the attendances at Executive meeting during the year to mid-April since the date of the last Convention:

Name	Attended	Possible Attendances
Dr. D. A. Wardlaw	14	14
Surg/Capt. S. J. Lloyd	7	
Mr. K. V. Roget	13	
Mr. K. C. Seddon	13	
Mr. P. A. Wolfenden	13	
Mr. R. J. L. Kelly	6	9
Mr. G. F. Scott	4	5

(Mr. W. E. J. Roper attended 10 and Mr. D. J. B. Hull attended 6 meetings).

IARU HQ MEETING

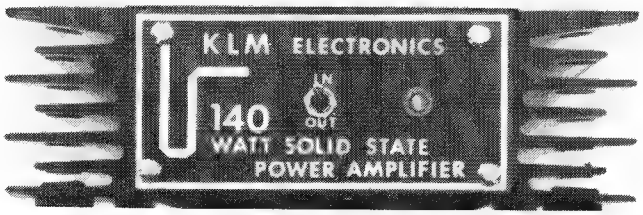
The meeting in Miami with representatives of all Regions and many Societies was extremely valuable and will be reported on separately to save time. I also visited ARRL HQ and VE3CJ in Canada.

D. A. WARDLAW,
President. ■

KLM PRODUCTS

they're heard when others aren't

- **HIGH GAIN ANTENNAS IN KIT FORM**
  (1) All parts except elements and booms.
  (2) All parts except booms.
  - 144-148 MHz — 8 Models including 2 for circ. polarization.
  - 420-470 MHz — 5 Models including 16 el. 12 ft. boom 15 dB gain.
  - 52-54 MHz available shortly.
- **QUARTER WAVE SLEEVE BALUNS**
  2-way and 4-way power dividers and couplers:
  144-148 MHz
  420-470 MHz
  - Tubing, Lowloss coax., connectors, etc.



- **SOLID STATE AMPLIFIERS (13.5V DC Nominal)**
  To suit your FM/CW/SSB rig (no tuning micro-stripline circuitry).
  - 144-148 MHz — 14 Models including 7 linears.
  - 420-450 MHz — 5 Models including 2 linears.
  - 52-54 MHz available shortly.

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MELBOURNE (03) 560 0986 A.H. (Mike)

Interstate Representation:

GOLD COAST COMMUNICATIONS

17A Ashton St., Labrador, Q. 4215 (075) 37 3926 (Mike)

Wireless Institute of Australia Executive Financial Report

For the year ended 31st December, 1975 the Institute incurred a Net Surplus of $13,452.00.

The Executive has taken reasonable steps, before the Statement of Income and Expenditure and Balance Sheet were made out to ascertain that action had been taken in relation to the writing off of bad debts and making of provision for doubtful debts and to cause all known bad debts to be written off and adequate provision to be made for doubtful debts.

At the date of this report, the Executive is not aware of any circumstances which would render the amount written off for bad debts, or the amount of the provision for doubtful debts, inadequate to any substantial extent.

At the date of this report, the Executive is not aware of any circumstances which would render the values attributed to current assets in the accounts misleading.

At the date of this report no charges exist on the assets of the Institute which have arisen since the end of the financial year and does not secure the liabilities of any other person.

There does not exist any contingent liability which has arisen since the end of the financial year.

No contingent liability or any other liability has become enforceable within the period of twelve months after the end of the financial year which in the opinion of the Executive will or may affect the ability of the Institute to meet its obligations when they fall due.

Since the end of the previous financial year the Executive has not received or become entitled to receive a benefit by reason of a contract made by the Institute or a related corporation with the Executive or with firms of which they are members or with companies in which they have substantial financial interests.

The results of the Institute's operations during the financial year were in the opinion of the Executive not substantially affected by any item, transaction or event of a material and unusual nature. There has not arisen in the interval between the end of the financial year and the date of the report, any item, transaction or event of a material and unusual nature likely, in the opinion of the Executive, to affect substantially the results of the Institute's operations for the next succeeding financial year.

K. C. SEDDON, Councillor
K. V. ROGET, Councillor

BALANCE SHEET AS AT 31ST DECEMBER, 1975

	1975	1974
MEMBERS' FUNDS		
Accumulated Fund	$6,067	($7,385)
Reserve Fund	627	627
Special Funds — ITU	7,766	7,206
IARU	3,050	3,306
	$17,510	$3,754
Represented by:		
CURRENT ASSETS		
Cash at Bank — General Account	$1,951	$3,578
IARU Account	—	446
Short Term Deposit	5,750	—
ITU Deposit	8,000	—
Special Bonds	—	7,000
Sundry Debtors — Less Provision	14,840	5,656
for Bad Debts	(2,000)	(200)
Stock on Hand — at Cost	3,532	4,613
	32,073	21,093
NON CURRENT ASSETS		
Furniture and Fittings — at Cost	1,611	2,162
Less Provision for Depreciation	322	551
	1,289	1,611
	33,362	22,704
DEDUCT CURRENT LIABILITIES		
Sundry Creditors	$1,052	3,325
Subscriptions in Advance	12,166	14,750
Loans — VK6 Division	—	250
VK4 Division	—	125
Provision for Superannuation	1,250	500
Deposits — Magpubs	300	—
Darwin Donations	1,084	—
	15,852	18,950
	$17,510	$3,754

STATEMENT OF INCOME AND EXPENDITURE FOR YEAR ENDED 30TH JUNE, 1975

	1975	1974
INCOME		
Members' Subscriptions	$40,465	$29,645
Surplus — Publications (Note 1)	612	4,494
Interest Received	300	198
Levies Received	16,500	—
Call Book	1,982	—
Sundry Income	—	223
	59,859	34,560
EXPENDITURE		
Amateur Radio Deficit (Note 2)	$15,498	16,804
Audit Fees	150	150
Bank Charges	316	296
Convention Expenses	1,876	—
Contribution — IARU	—	850
Committee Expenses	259	377
Depreciation	322	403
EDP Expenses	2,114	625
General Expenses	298	346
Insurances	594	176
Legal Expenses	29	—
Provision for Bad Debts	1,800	—
Postage & Freight	2,026	1,435
Project Australis	1,180	653
Rent and Rates	1,787	1,759
Repairs and Maintenance	283	79
Superannuation	750	500
Stationery and Printing	1,149	1,250
Salaries and Secretarial	15,371	14,646
Telephone	459	379
Travelling Expenses	146	860
	46,407	41,588
NET SURPLUS/DEFICIT	13,452	(7,028)
Accumulated Fund Brought Forward	(7,385)	(357)
ACCUMULATED FUND	$6,067	($7,385)

NOTES TO AND FORMING PART OF THE ACCOUNTS

	1975	1974
1. **PUBLICATIONS**		
Sales to Members	$11,482	$8,425
Less Cost of Sales	10,870	3,931
	612	4,494
2. **AMATEUR RADIO**		
Income		
Advertising	$18,452	$10,204
Subscriptions	890	309
Sundry Income	1,243	571
	20,585	11,084
Expenditure		
Awards	$65	85
Bad Debts	172	57
Honorariums	2,725	2,520
Postage	5,428	3,673
Publishing and Printing costs	24,471	17,913
Salaries	2,305	1,572
Travelling and Sundries	917	2,067
	36,083	27,887
DEFICIT FOR YEAR	$15,498	$16,803

WIRELESS INSTITUTE OF AUSTRALIA EXECUTIVE STATEMENT

In our opinion

(a) The Statement of Income and Expenditure is drawn up so as to give a true and fair view of the surplus of the Institute for the financial year ended 31st December, 1975.

(b) The Balance Sheet is drawn up so as to give a true and fair view of the state of affairs of the Institute as at the end of the financial year.

K. C. SEDDON, Councillor
K. V. ROGET, Councillor

STATEMENT BY PRINCIPAL ACCOUNTING OFFICER

To the best of my knowledge and belief the accounts for the year ended 31st December, 1975, give a true and fair view of the matters contained in Section 162 of the Companies Act 1961, and required to be dealt with in the accounts as presented.

P. B. DODD, Principal Accounting Officer

AUDITORS' REPORT TO THE MEMBERS OF THE WIRELESS INSTITUTE OF AUSTRALIA

1. In our opinion the attached accounts give a true and fair view of the state of the Institute's affairs at 31st December, 1975 and of its surplus for the year ended on that date.
2. As required by the Companies Act 1961, we report as follows:
   In our opinion
   (a) The attached accounts are properly drawn up
      1) So as to give a true and fair view of the matters required by Section 162 to be dealt with in the accounts; and
      2) in accordance with provisions of that Act
   (b) The accounting records and other records, and the registers, required by the Act to be kept by the Company have been properly ke in accordance with the provisions of that Act.

HEBARD & GUNNING
CHARTERED ACCOUNTANTS
P. W. HEBARD, Partner
Melbourne
4th March, 1976 ■

MEMBERSHIP STATISTICS

These are compiled from the EDP data at mid-December 1975 input and P & T Department data kindly supplied as at 31.12.1975.

TABLE 1. Totals (Previous year below).

	Total Licensees	WIA licensed members	% member to total licensees	Other WIA members	Total WIA members
VK1	126	83	66	35	118
	126	64	50	26	
VK2	2233	957	43	232	1189†
	2200	968	44	225	
VK3	2144	1074	50	345	1419
	2122	1083	46	366	
VK4	815	457	56	155	612
	781	426	55	174	
VK5/8	835	473	57	191	664*
	843	451	54	186	
VK6/9X	521	278	53	69	3
	526	268	51	63	
VK7	239	160	67	64	224
	238	160	67	53	
VK0	6	—	—		
	5				
TOTALS	6919	3482	50	1091	4573
	6841	3420	50	1093	4513

*Includes "21 Junior Associates" (3 with call signs).
†Includes Norfolk Is. (5) — Christmas Is. (3).

TABLE 2. Call Sign distribution of members

	Full		Limited				
	2 l.	3 l.	"C"	"Z"	"Y"	O.S.	Total
VK1	58	5	—	20	—	—	83
VK2	288	400	4	230	30	5	957*
VK3	352	393	6	231	82	10	1074
VK4	310	9	2	123	—	13	457
VK5/8	326	4	—	138	—	5	473
VK6/9X	228	3	1	45	—	1	278†
VK7	105	—	1	53	—	1	160
TOTALS	1667	814	14	840	112	35	3482

*Includes 1 on Lord Howe Island.
†Includes 2 on Christmas Island.
O.S. = Overseas — includes 19 in PNG.

TO OUR VALUED MAIL ORDER CUSTOMERS

WE SINCERELY APOLOGISE FOR THE DELAYS IN FULFILLING MAIL ORDERS DURING MAY AND JUNE. OUR PREVIOUS DAILY MAIL ORDER SERVICE HAS BEEN OPERATING AT UP TO 14 DAYS DELAY BECAUSE OF UNPRECEDENTED DEMAND. OUR STAFF ARE STARTING AT 6.10 AM EVERY MORNING AND WE ARE DOING EVERYTHING POSSIBLE TO INCREASE THE OUT PUT WITHOUT INCREASING MISTAKES.
WE BELIEVE THAT WE SHOULD BE COMPLETELY UP TO DATE BY THE TIME THIS ADVERTISEMENT APPEARS.

DICK SMITH AND STAFF

POSITIONS VACANT

MAIL ORDER STAFF

WE DESPERATELY REQUIRE STAFF FOR OUR MAIL ORDER DEPARTMENT. MUST BE CONSCIENTIOUS AND HAVE A GOOD BASIC ELECTRONIC KNOWLEDGE.
WHY NOT COME TO SYDNEY FOR A WORKING HOLIDAY ?

AMATEUR RADIO MANAGER

WE AT DICK SMITH ELECTRONICS REQUIRE THE SERVICES OF A SALESMAN WITH THE KNOWLEDGE OF TWO-WAY RADIO, COMMUNICATIONS AND TEST EQUIPMENT.
THE APPLICANT PREFERABLY SHOULD HOLD AN AMATEUR RADIO LICENCE AND OR BE INTERESTED IN THIS FIELD.
THE APPOINTMENT IS IN OUR GORE HILL STORE.
PLEASE PHONE SANDY BRUCE SMITH (VK2AD), COMMUNICATIONS MANAGER ON 439-5311 FOR DETAILS

MAIL ORDER MANAGER

We require the services of a dynamic electronic enthusiast to work with and supervise a high volume component assembly section in our Mail Order Department.

Comprehensive knowledge of electronic components is needed, coupled with the ability to train and control staff in a department that has a track record of rapid growth.

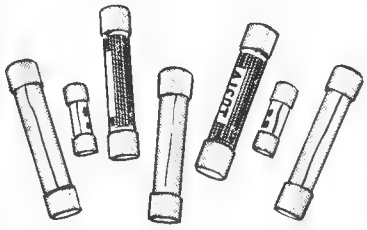
Please contact John Hemsley on 439 5311 in Sydney, between the hours of 9am to 5pm or phone Sydney 918 8532 after hours.

DICK SMITH ELECTRONICS

P. O. Box 747, Crows Nest, N. S. W., 2065.
Phone 439 5311.

R.H. Cunningham Pty. Ltd.

Protect your instruments and equipment with ALERT cartridge fuses



ALERT fuses are "on guard" against electrical overloads in Electronic, Industrial and Telecommunications installations. Manufactured by Kenneth R. Beswick Ltd., U.K., the ALERT range include British Military Standards, British P.O. Standards, and many of the international specifications.

Popular Sizes EX-STOCK

TDC 10: 1¼" x ¼" Quick acting 100 ma to 25 amp.
TDC 11: 1¼" x ¼" Slow blow (or delay) 60 ma to 10 amp.
TDC 13: 20mm x 5 mm Quick acting 63 ma to 3 amp
TDC 69: ⅝" x 3/16" Quick acting 25ma to 10 amp.
TDC 123: 20mm x 5mm Slow blow 100 ma to 2.5 amp.

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Telex Melbourne, 31447
Sydney 21707 Brisbane, 41500 Perth, 93244

A few words from "IZNIBS"

Technicalities. Recent additions to the Vicom shelves have included a range of DAIWA accessories not before imported to Australia. The most impressive in their antenna couplers is a unit capable of handling – well like the Rolls Royce specifications power is sufficient! The two speech compressors are extremely well finished and come complete with built in two tone generator and AC/DC operation. Incidentally, it's the first time we have seen Japanese equipment come into the country with 3 pin plugs already fitted!

For the UHF experimenter we have KURANISHI dummy loads of 120 watt rating up to 500 MHz and DAIWA have an excellent SWR bridge for the 2 metre and 70 cm bands.

TRIO have just released their top of the range TS820. It is to replace the 599 series and incorporates such refinements as optional digital read out IF shift control or "pass band tuning" which enables a shift of unwanted signals from the receiver pass band without changing the receive frequency. Sorry its not all solid state but it does use the same tube line-up as the TS 520. Frequency range is 1.8-29.7 MHz: – Price well - certainly not middle of the road, but looks like a recommended retail of $830 for the basic unit with the digital read out option about $160. Drop me a note for further details.

The last report of the Director of Consumer Affairs in Victoria contains the following paragraphs:

"One is constantly astounded at consumers who fail to take even the simplest of precautions in their dealings.

"With the best of intentions and an abundance of staff, it would be impossible for any consumer affairs organisation to gain redress for all the irresponsible consumers who recklessly buy items from backyarders, engage spurious tradesmen who door knock for business, or who sign documents without reading them.

"It was John Ruskin who said:

'There is hardly anything in the world that someone cannot make a little worse and a little cheaper, and the people who consider price alone are this man's lawful prey.'

"It is not the role of consumer affairs to get redress for a person whose only consideration was price . . ."

We of course, have had the experience of amateurs buying equipment from self appointed (and "bargain priced") agents, finding problems and then coming to us somewhat apologetic and red-faced.

Naturally we do what we can, but the above comment sets out quite clearly the position you are in when major consumer items are purchased, or have them repaired.

The moral of all this is obvious buy from a company who has manufacturer support!

It is interesting to note that the Atlas noise blanker works on the same principle as the famous LAMB noise silencer and the grey hairs in our ranks should remember all about it as it appeared in various guises in the ARRL handbook QST etc., for a long long time. We are now offering the Atlas with noise blanker and the antenna matching transformer for $695 and with the small circuit improvements that have been incorporated over the last 12 months, the ideal mobile rig is better than ever.

73 PETER 31Z

VICOM International Pty Limited

TABLE 3. P & T Department lincensees distribution (members in brackets)

	Full	Limited	Totals
VK1	100 (63)	26 (20)	126 (83)
VK2	1586 (691)	642 (259)	2228 (950)
VK3	1344 (751)	800 (313)	2144 (1064)
VK4	543 (321)	272 (123)	815 (444)
VK5	528 (318)	255 (134)	783 (452)
VK6	392 (230)	126 (44)	518 (274)
VK7	161 (105)	78 (53)	239 (158)
VK8	42 (14)	10 (6)	52
VK9 Christm.	—	—	3
Norf.	—	—	5
VK0	—	—	6
TOTALS	4696 (4665)	2209 (2176)	6919 (6841)

TABLE 4. WIA member clubs and groups

VK1	2
VK2	16
VK3	18
VK4	15
VK5	3
VK6	8
VK7	—
	62

TABLE 5. Distribution of members (see note after the table) — (overseas excluded)

State C/s	"Metropolitan"	"Country"	"Interstate"	N.T.	(Br. Hill)
VK1 Full 2	56	—	2	—	—
Full 3	4	—	1	—	—
Associates	19	—	1	—	—
VK2 Licensed	565	376	9	2	(2)
Associates	120	98	6	2	—
VK3 Licensed	746	304	14	—	—
Associates	258	83	1	1	—
VK4 Licensed	203	234	7	—	—
Associates	81	68	1	—	—
VK5/SA Licensed	344	98	10	—	(4)
Associates	154	23	4	—	(1)
VK5/NT Licensed	6 (D.)	10 (O.)	= 16		
Associates	5 (D.)	4 (O.)	= 19		
VK5 Totals Licensed	344	114	10	—	—
Associates	154	32	4	—	—
VK6 Licensed	209	62	4	—	—
Associates	46	23	—	—	—
VK7 **Licensed**					
Hobart	68				
Launceston	40				
Other	49				
Associates					
Hobart	25				
Launceston	14				
Other	23				
Total VK7					
Licensed	157	—	2	(1)	—
Associates	62	—	1	—	—

NOTES

1. Members with postal addresses in the post codes stated are classified as "Metropolitan" for the purposes of this table:

Sydney	2000 to 2233
Brisbane	4000 to 4179
Darwin	5789 to 5794
Hobart	7000 to 7022
Melbourne	3000 to 3206
Adelaide	5000 to 5173
Perth	6000 to 6169
Launceston	7150

1. A total of 15 "Associates" overseas is excluded.

TABLE 6. "Other" grades in EDP (excludes Clubs —excludes "X" for double callsign)

Grade:	G	L	X	S
VK1	—	2*	—	1
VK2	38	12	—	32
VK3	3	15*	10	165
VK4	15	3	5	25
VK5/8	17	5	24	5
VK6	8	5	—	11
VK7	2	5	2	5
Exec.*	—	10*	—	— (1 in ACT others VK3)

*Excludes "L" members.

TABLE 7. Pensioners and Students (at that time mixed "G" & "S")

	Pensioners*	Students
VK1	—‡	1†
VK2	46	24
VK3	46	122
VK4	26	14†
VK5	17	5
VK6	12	7
VK7	2	5
	149	178

*Excludes "L" members.
†Grade now discontinued for students.
‡No pensioner grade.

INTRUDER WATCH

Alf Chandler, VK3LC

1536 High Street, Glen Iris, 3146

The Intruder Watch net is still in operation on 14160 kHz, but the time has been altered to 0000Z or 10 AM EAST every Thursday morning. So far only co-ordinators have availed themselves of the opportunity of participating in this net. However, it is hoped that as it becomes better known observers and members interested in the Intruder Watch will participate.

The object of the net is to disseminate news and information of interest to observers and co-ordinators, and to take ideas and anything of interest for the better running of the Watch.

Preliminary reports of intruders may be voiced, but observations should be followed by written reports on forms provided. Too many verbal reports are time consuming for co-ordinators, and reports made out by co-ordinators for observers lack the original signature which is important to our administration. Co-ordinators should only sign their own reports. However, when reports **are** phoned in or copied over the air, co-ordinators are at liberty to sign the observers name per their own signature.

The new report forms will have been distributed by the time this is in print, and it is encumbent upon me to instruct members in their compilation. The new forms are for identified intruders only, one station to a form, although many observations of that station may be included so long as it remains on the same frequency. The forms are filed by our administration by frequency, the object being that they can at any moment ascertain what is going on on any particular frequency.

And now I had better go over the form, letter by letter. The letter before each item is there to conform with the requirements of Appendix 8 of the regulations. In its original form Appendix 8 specifies "Report of Harmful Interference" and the various designations go down vertically. However, for better filing "A" and "B" have been placed horizontally Taking the designations in order, "A" in the original says "Name or Call Sign and Category of Station", but we have designated it "A-Ident . . . Callsign . . ." This is so that A3 (B/C) stations can be inserted by their name, e.g., "Radio Peking", and A1 (CW) or F1 (RTTY) stations by their callsigns. "B-Frequency" is self explanatory, but it is advisable to know whether it is "E" Estimated or "M" Measured.

So much for the horizontal section. "C-Emission" has to be filled in as A1, A3 F1, A3A etc., and if you are not familiar with these modes it would be a good idea to send me a tape, either C90 cassette or reel that will play for 40 minutes so that I can dub my identification tape on to yours. "D-Bandwidth" seems to be a pet aversion with our Authorities and is rather hard to define, it depends upon you receiver selectivity. "F-Nature of Interference: Traffic: Remarks" — In the case of A1, some of the traffic copied including callsign and any procedure sign copied. F1 RTTY, a read-out of traffic is very helpful if you have the facilities to copy same. Remarks can include a bearing report if possible. "O-Dates & Times (UT)", as many reports on one signal as possible with Z time; and "E-Strength (RST)" your normal way of reporting transmitted signals. "M", "N" is self explanatory.

This should give a fair idea of what is necessary, and I hope that I receive many reports now that some action is promised by our Administration if sufficient reports are forthcoming. ■

MAGAZINE INDEX

Syd Clark, VK3ASC

BREAK-IN March 1976
The Good Old Days; From Spark to Space; Modernise Your VTVM — Fit a FET; Build Your Gear Safely; International Recognition of Amateur Radio.

April 1976
All Purpose Testing and Servicing Unit; NZART Annual Report; A Motorized Garage Door; Improving the Argonaut; Predicting Propagation.

HAM RADIO February 1976
DT-600 Demodulator; Solid State Power Amplifiers; Vestigial Television System; Low Cost Digital Clock; VHF Prescaler for Digital Counters; 50 Years of Television; 1979 WARC; Microprocessors; Antenna Gain; The UAR/T and How it Works; Voltage Troubleshooting.

March 1976
Crystal Controlled Oscillators; DT-500 RTTY Demodulator; WWVB Signal Processor; High-Speed Divide-by-N Counters; Off the Air Transmitter Tuneup; VHF/UHF Receivers — How to Improve Them; 5/8 Wavelength Vertical for Two-Metre FM; Microprocessors; High Performance Bench Power Supply.

April 1976
Programmable Contest Keyer; Solid-State Communications Receivers; 741 Op-amp Circuit Design; Corner Fed Loop Antennas; Amateur Radio's Golden Years; Circuits and Techniques; Microprocessors; 80 Metre SSB Transceiver; Universal LCR Bridge; Troubleshooting by Resistance Measurement.

RADIO COMMUNICATION April 1976
The G8ENN Instant Beam; The Scopex 4D-25 Oscilloscope — Review.

May 1976
The Case for a Data Processor; Suppression of Vehicle Interference for Mobile Radio Operation; A Simple Magnetic Base; Mobile with Fibreglass Cars; MK Products Slow Scan Monitor PCB's — Review; 28 MHz Sporadic-E; PLL Introduction.

RADIO ZS February 1976
YACHTING IN THE SEYCHELLES; Crystal Oscillators for Digital Circuitry; TVI/BCI Interference; The Importance of the LC Ratio in Competitive DF Hunting; Quarter Wave and Half Wave Lines on the Workbench; Rip Van Winkle Rides Again; Double Sideband Suppressed Carrier; Assembling a Kit-form Transmitter; Caves.

March 1976
Hamnet; Electromagnetic Radiation.

MONITOR January and February 1976, and March 1976
The Institution of Radio and Electronics Engineers has replaced their "Proceedings" with this new Journal. This appears to be an attempt at improving the image of the IREE and the presentation is certainly more lively than the old format. Furthermore it appears that much of the content is now aimed at a broader cross-section of the membership. Your reviewer feels certain that this move will be welcomed by many members of the Institute. ■

AWARDS COLUMN

Brian Austin, VK5CA

The following general rules apply to all Awards issued by the Associzione Radiotecnica Italiana (ARI) and should be read together with the conditions which govern each individual certificate.

1. All information requests must be sent to the ARI Awards Manager, C/o ARI, via D. Scarlatti, 31, 20124 Milano, Italy accompanied by one IRC.

2. ARI Awards will be issued to any amateur who will submit to our Manager —
   — a letter, dated and signed, with name, address and call of the applicant. He must certify that all administrative rules in his own country have been respected, in the same way as amateur radio spirit, in effecting the QSO's upon which the application is based.
   — the complete list of QSL's, with call sign, date, frequency, reports, time and type of emission (CW, AM, SSB, RTTY).
   — QSL cards for checking.
   — 10 IRCs or $1 for foreign applicants. The "Guglielmo Marconi Award" is free (only mail fee).
   — QSL cards must be submitted without corrections, erasures or additions and must be clearly legible. If the type of transmission is not shown, two figures (RS) count as PHONE (AM, not SSB) and three (RST) as CW.
3. To get an Award in a specific class, the cards must show the corresponding data in clear manner.
4. In application of the decisions of the Region 1 of IARU, all foreign applicants may send a check list of the cards (without QSL's) duly certified by a member of the HQ of their National Amateur Radio Society. The ARI Manager reserves to check, on request, one or more QSL's.
5. ARI HQ decisions are final. Any cards falsification will result in disqualification.
7. Send the applications to the following address:
   ARI Award Manager,
   C/o ARI
   via D. Scarlatti 31,
   20124 Milano, Italy.

CERTIFICATO DEL MEDITERRANEO (CDM)

1. The CDM is issued to those amateurs who can show confirmation of a two-way contact since 1st June, 1952 with
   (a) a fixed amateur station in at least 22 countries of the list (pay attention, in the list there is not peninsular Italy).
   (b) at least 30 amateur stations of peninsular Italy (total: 52 QSL).
2. The same station may be worked once only.
3. The CDM is issued in two classes:
   (a) PHONE and CW (AM, SSB, CW, RTTY).
   (b) PHONE only (AM, SSB).
4. The minimum reports considered are RST 338 and RS 33.

List of countries:

Spain	Dodecanese Is.
Balearic Islands	Crete
Spanish Morocco	Turkey
French Morocco	Syria
France	Yugoslavia
Algeria	Albania
Corsica	Malta
Trieste (before 31-12-1957)	Gibraltar
	Cyprus
Sardinia	Monaco
Sicily	Tunisia
Lebanon	Israel
Egypt	Libya
Greece	

WORKED ALL ITALIAN PROVINCES (WAIP)

1. The WAIP is issued to those amateurs who can show confirmation of a two way contact since 1st January 1949 with —
   a fixed amateur station in at least 60 provinces of the Italian Republic, for foreign amateurs.
2. The same station may be worked twice or more, if in different provinces.
3. The minimum reports considered are: RST 338 and RS 33.

List of Italian provinces:

Agrigento	Matera
Alessandria	Messina
Ancona	Milano
Aosta	Modena
Arezzo	Napoli
Ascoli Piceno	Novara
Asti	Nuoro
Avelino	Padova
Bari	Palermo
Belluno	Parma
Benevento	Pavia
Bergamo	Perugia
Bologna	Pesaro
Bolzano	Pescara
Brescia	Piacenza
Brindisi	Pisa
Cagliari	Pistoia
Caltanissetta	Pordenone
Campobasso	Potenza
Caserta	Ragusa
Catania	Ravenna
Catanzaro	Reggio Calabria
Chieti	Reggio Emilia
Como	Rieti
Cosenza	Roma
Cremona	Rovigo
Cuneo	Salerno
Enna	Sassari
Ferrara	Savona
Firenze	Siena
Foggia	Siracusa
Forli	Sondrio
Frosinone	Taranto
Genova	Teramo
Gorizia	Terni
Grosseto	Torino
Imperia	Trapani
Isernia	Trento
L'Aquila	Treviso
La Spezia	Trieste
Latina	Udine
Lecce	Varese
Livorno	Venezia
Lucca	Vercelli
Macerata	Verona
Mantova	Vicenza
Massa	Viterbo

(Concluded next issue) ■

YRCS

Bob Guthberlet

31 Bandon Terrace, Marino, 5049

Bob Guthberlet at the recent convention.

IMPRISONED FOR FOUR DAYS

Having received an invitation from the Federal Executive of the WIA to attend the 1976 Convention for the purpose of presenting the claims of YRCS, I journeyed to Melbourne, arriving on Thursday 6th May, and was conveyed to the Diplomat Motor Inn at St. Kilda, the venue for the Convention. Being a non-member of the Council, my early feelings were that I would become a tolerated interloper, an attitude quickly dispelled by the generous welcome given to me by the Councillors and their substitutes, who had gathered from all parts of Australia to conduct the business and policy of the WIA.

My first thought was that it would prove an easy period of relaxation during which I should be able to take an occasional walk along the St. Kilda boulevard, scan the shop windows, or enjoy the occasional wafting of refreshing sea breezes from the bay. How wrong I was. With relentless pressure and sometimes the discomfort of sitting for hours on a hard seat, I saw nothing of the sights which had been anticipated. Even sharing a room with the indefatigable Secretary-Manager, Peter Dodd, gave me no respite, as he had arranged with the Motel management to awaken us at 5.30 am each day.

It was my hope than on Thursday evening we would be allowed to rest, but it wasn't to be, as preliminary discussions continued until 1 am and this proved to be the pattern for each day's business, starting at 9 am and continuing until the early hours of the next day, with brief meal breaks, during which delegates somehow managed to talk about the many subjects for deliberation. Frankly, I enjoyed seeing a little of Melbourne as we journeyed to the Airport on Sunday evening, although the hazardous traffic manipulating made one feel relieved that Adelaide is a nice quiet City in which to live.

For the first time since its inauguration YRCS and its future was discussed and debated with dedicated concern, causing me to re-valuate my previous impressions of a Federal WIA convention. I have returned home with feelings of great respect for those who control and manage the affairs of amateur radio in this country, and, having been given the opportunity to share, with some discomfort, the hours of incarceration, I look back in retrospect and offer my sincere thanks to the WIA Federal Executive and delegates for services rendered. I say to all who are recipients of Institute decisions, please support the WIA and don't rubbish it. It works and is doing all that can be reasonably expected of those willing to spend four days in prison

Important matters concerning YRCS will be communicated to State YRCS Supervisors in due course of time, the result of which will I hope, give to the Scheme a more stable and effective means of achieving our aims in the interest of those whom we serve. ■

PROJECT AUSTRALIS

David Hull, VK3ZDH

AUGUST 1976

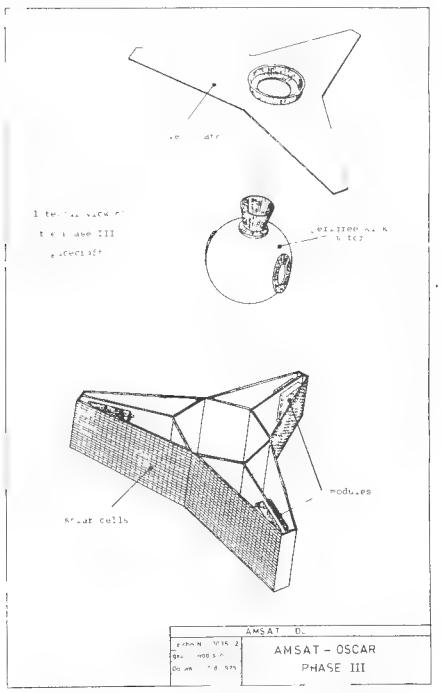
OSCAR 6				OSCAR 7			
Date	Orbit No.	Time Z	Long °W	Date	Orbit No.	Time	Long °W
1	17348	01.14	75.08	1	7822	01.19	69.74
2	17360	00.14	60.08	2	7834	00.18	54.62
3	17373	01.09	73.83	3	7847	01.13	68.24
4	17385	00.09	58.83	4	7859	00.12	53.12
5	17398	01.04	72.58	5	7872	01.06	66.74
6	17410	00.04	57.58	6	7884	00.06	51.62
7	17423	00.59	71.33	7	7897	01.00	65.24
8	17436	01.54	85.08	8	7910	01.54	78.86
9	17448	00.54	70.08	9	7922	00.53	63.74
10	17461	01.48	83.83	10	7935	01.48	77.36
11	17473	00.48	68.83	11	7947	00.47	62.24
12	17486	01.43	82.58	12	7960	01.41	75.86
13	17498	00.43	67.58	13	7972	00.41	60.74
14	17511	01.38	81.33	14	7985	01.35	74.36
15	17523	00.38	66.33	15	7997	00.34	59.24
16	17536	01.33	80.08	16	8010	01.29	72.86
17	17548	00.33	65.08	17	8022	00.28	57.74
18	17561	01.28	78.83	18	8035	01.22	71.36
19	17573	00.28	63.83	19	8047	00.21	56.24
20	17586	01.23	77.58	20	8060	01.16	69.86
21	17598	00.23	62.58	21	8072	00.15	54.74
22	17611	01.18	76.33	22	8085	01.09	68.36
23	17623	00.18	61.33	23	8097	00.09	53.24
24	17636	01.12	75.08	24	8110	01.03	66.86
25	17648	00.12	60.08	25	8122	00.02	51.74
26	17661	01.07	73.83	26	8135	00.57	65.36
27	17673	00.07	58.83	27	8148	01.51	78.98
28	17686	01.02	72.58	28	8160	00.50	63.86
29	17698	00.02	57.58	29	8173	01.44	77.48
30	17711	00.57	71.33	30	8185	00.44	62.36
31	17724	01.52	85.08	31	8198	01.38	75.98

Report on May '76 AMSAT Phase III design review meeting, Goddard Space Flight Centre, Maryland, USA.

The meeting was concerned with reviewing completed work and engineering parameters of the next amateur satellite due to fly in 1978.

Attendees included Larry Kayser VE3QB (Amsat Canada), Karl Meinzer DJ4ZC (Amsat DL), Dick Kolbly and Marvin Sass (San Bernandina Microwave Society), Dave Hull VK3ZDH (Project Australis), Jan King W3GEY, Tom Clark WA3LND and Perry Klein K3JTE (Amsat HQ). Observers included Lance Gunner K6GSJ (Project Oscar), Bill Eitel (Amateur Satellite Service Committee), Bill Tynan W3KMV, Marty Davidoff K2UBC, Bob Carpenter W3UTC and Dick Allen W5SXD (Amsat).

Detailed computer examinations of the phase III orbit parameters to be expected after the AKM burn, undertaken for Amsat by NASA personnel and others, were reviewed. The circuitry of the IHU module (Integrated Housekeeping Unit, the main computer module) was explained in detail by Dr. Meinzer. The group noted with satisfaction the results of the successful operation of the basic unit in a hostile industrial environment, concerned with data collection aboard railway trains in Germany. Conducted by Karl's University this experiment involved mounting the unit in a physically and electrically dirty position alongside high voltage relays within the train. Details of the attitude sensing and magnetic torqueing circuitry were examined as was the basic interface to the "bang bang" department concerned with the AKM motor firing. Mechanical models of the basic spacecraft and a Thiokol AKM motor were available for revue. RF circuitry was not dealt with in any great detail as the technology is not new, being developments



only of existing techniques. However preliminary transponder frequencies were chosen as follows:—

2 meter input/output: 145.850-145.990 MHz.

70 CM input/ouput: 435.150-435.295 MHz.

Engineering beacons were set at 145.845 MHz and 435.145 MHz. General beacons were set at 145.845 MHz and 145.995 MHz.

Transponder input filters will be chosen so as to keep the beacon frequencies clear of transponder QRM, this being a problem with Oscars 6 and 7.

The prototype GSE circuitry from Australis was reviewed and standards chosen for parameters concerned with computer memory storage etc. Consideration will be given to publishing sufficient information on GSE circuitry so as to allow interested amateurs to build up hardware capable of decoding the engineering beacon data.

In general the meeting was most successful. Much has been accomplished in Germany and elsewhere since the last meeting and the program is proceeding satisfactorily to timetable. However one area of prime concern still rests with the procurement of suitable solar cell panels. The purchase of space qualified panels from commercial sources is very expensive (approx. $30,000 or more for Oscar 8) and the supply of surplus panels from Nasa and Military space programs has virtually dried up. Contributing to this has been the "bleeding off" of space qualified panels by universities and others for use on terrestrial experiments. This unfortunate use of space qualified hardware is a problem that will remain to dog future amateur spacecraft construction. The JA Amsat organisation under Harry Yoneda JA1ANG has been active in pursuing solar arrays through commercial sources in Japan and it is hoped that Harry will meet with success in this field.

During the second week of my stay an international meeting was held to discuss the operations of Oscars 6 and 7 and preplan for Oscar 8. A report on this meeting will be given next month. ■

REPEATERS

Ken Jewell, VK3ZNJ
Peter Mill, VK3ZPP

The 1976 Federal Convention has come and gone with decisions made which will affect all repeater users and these will be reported on later in this column. However, to clarify the position of the Federal Repeater Committee to our readers, it is worthwhile quoting from the annual report, prepared by the Chairman Ken Seddon VK3ACS, the section outlining the functions of the FRC; "The Committee does not consider that its function is to make rules, decisions, etc. pertaining to the operation of repeaters but rather to circulate by correspondence (and telephone discussion) the proposals and opinions of all Divisions affecting repeater operations on a national level and where these differ to arrive at a compromise recommendation acceptable to all Divisions".

As you can see the FRC can only function as the voice of all state groups with your co-operation, and keeping your State Repeater Committee or Federal Councillor informed of your activities and thoughts is the way to assist us in arriving at recommendations.

FEDERAL NEWS

The Federal news for this issue is concerned with results of the Convention. The motions that were passed in relation to repeaters are summarised below:

(a) FM repeaters in the 146 to 148 MHz band will be designated by the input frequency channel number e.g. the existing channel 1 now on 146.100 MHz on channel 42 becomes repeater 42.

(b) The creation of an additional repeater channel as repeater 41 with an input on 146.050 MHz has been adopted.

(c) The channel spacing for the FM portion of the 70 cm band will be 25 kHz.

(d) The channel numbering in the two FM windows of the 71 cm band will be as follows:

433.025 MHz = channel 302 up to 434.975 MHz = channel 497

438.025 MHz channel 802 up to 439.975 MHz channel 997

(e) The primary simplex channel in the 70 cm band will be 439.000 MHz, the secondary channel 438.825 MHz, followed by 439.125 MHz.

(f) The repeater channels shall have a spacing of 5 MHz between the input and output frequencies within the two windows 433.00-435.00 MHz and 438.00-440.00 MHz, the input low and output high.

(g) The recommended UHF repeater channels for initial use are: primary channels

352/852 433.535 MHz and 438.525 MHz followed by

322/822 433.225 MHz and 438.225 MHz

367/867 433.675 MHz and 438.675 MHz

VICTORIAN NEWS

The site for the proposed repeater for the Otway Ranges has been checked out and a range of about 100 km would appear to be possible in some directions. However, due to the hilly nature of the area, this will not be the case in all directions. Also there appears to be some concern at the use of channel R46 at this site, but this is only to be used for the testing phase and will not necessarily be the final frequency for the repeater.

At last there has been some progress with the Mt. Macedon R45 repeater as the owners of the proposed site for the transmitter have agreed to allow the rig there on terms acceptable to the group. On site testing can now be carried out by the project leader Peter VK3BX. The Victorian repeater committee reports that the new system of identifying repeaters by the input channel number, R41 to R48, will be adopted in that state in the following form. For ease of operation and simplicity, they will drop the forty part of the number and use R1 to R8. The following table was supplied:

Old system—repeater	New system	Victorian system
8	R41	R1
1	R42	R2
5	R43	R3
2	R44	R4
6	R45	R5
3	R46	R6
7	R47	R7
4	R48	R8

QUEENSLAND NEWS

The Rockhampton repeater has been granted a licence with the callsign VK4RAR on channel R42 and Adrian VK4MM hopes that it will be on the air by August. The control F2 identify and power supply are complete and the 25 watt Allied Communications (Brisbane Coy) transceiver will be cut in two soon. The system will be completely solid state except for two relays and fed to a ground plane through a diplexer. The test site will be the "Range" in the centre of Rockhampton and the final site will possible be the TV transmitter site at Mt. Hopeful which will give a range of around 100 km. There are believed to be other repeaters in Queensland aside from Brisbane and the Gold Coast.

WEST AUSTRALIAN REPEATERS

OPERATIONAL

CALLSIGN	Ch	LOCATION OR SERVICE AREA	TYPE OF IDENT	RANGE	PROJECT OFF.
VK6RAP	R42	Perth	FSK	80 km	VK6UU
VK6RAH	R44	Perth	audible	60 km	VK6ZAA
VK6RAA	R44	Albany	verbal	100 km	VK6XY
VK6RBY	R46	Mt. William	FSK	100 km	
VK6RAW	R48	Mt. Latham/Wagin	audible	90 km	VK6IQ

CONSTRUCTION STAGE

VK6RAK	R48	Boulder/Kalgoorlie	?	70 km	?

AFTER THOUGHTS

A LINEAR AMPLIFIER FOR AUSTRALIAN CONDITIONS

April: p. 15 col. 3, line 9 should read: "Fig shows a typical . . ."

May: p. 9 Fig 11 — Lower end of 1ohm WW resistor must be connected to earth side of 5 V filament winding on main Transformer. ■

QSP

CITIZENS' BAND

Radio Communication June '76 reported that the RSGB Council had been discussing "some activity in certain commercial quarters towards the introduction of a citizens' band". Mr. Stevens was reported as saying that he did not think it was possible for a citizens' band to operate within the region 27 to 28 MHz as this was used at present for tone controlled devices. "In addition there was a problem with the media, as citizens' band operators were always identified as amateurs".

NEWCOMERS NOTEBOOK

Rodney Champness, VK3UG
David Down, VK5HP

AN 80 METRE NOVICE RECEIVER — PART 3 — THE REGENERATIVE IF AND DETECTOR

The regenerative intermediate frequency amplifier and detector contributes a large proportion of the total receiver amplification and receiver selectivity. By adjustment of the regeneration control the receiver can resolve SSB, CW, AM or NBFM. Additionally, the IF bandwidth is controlled to suit the particular mode being received. Under some conditions the regenerative detector oscillator is, in fact, phase locked to the incoming carrier. The regenerative IF-Detector is an extremely high performance circuit using very few parts, but in recent years it has been largely neglected in favour of more complex circuitry with very little overall performance improvement.

THE REGENERATIVE IF-DETECTOR — HOW IT WORKS

The regenerative IF-Detector in the novice receiver is centred around a 6BX6 valve (V5). The circuit consists of resistors R59 to R63 inclusive, capacitors C63 to C68 inclusive, inductors L14 to L16 inclusive and V5 and V7. V7 is a voltage regulator and maintains a constant plate voltage on V5 so that frequency shift due to power supply variations is not troublesome.

L14 and L15, with associated tuning capacitors C63, C64 and C65 form a conventional valve-type intermediate frequency transformer (slightly modified) which is tuned to approximately 455 kHz. The IF transformer as picked out from the junk box does not have C65 fitted, so has to be modified accordingly.

Remove the transformer from its can and unsolder one end of the secondary winding, making sure that none of the very fine wires is broken. In most cases the primary and secondary windings are identical, the secondary being the one near the base. This group of separately insulated parallel wires is called Litz wire. The advantage attributed to Litz wire is that in some lower frequency coils and transformers the Q is increased above that which it would be with a single wire winding. A hole is drilled through the base of the IF transformer close to the other terminals and a small bolt and nut is fitted with a solder lug on each side of the base. The coil end is soldered to this lug, and C65 is soldered from this lug to the free end of C64. The modification is now complete and the transformer may be returned to the can. It is desirable to use a fairly large IF transformer so that this modification is accomplished easily. C65 may be mounted outside of the can if desired.

L14 and L15 are fitted with iron dust slugs. The presence of these slugs increases the inductance of the coils. By adjusting the position of the slug within each winding, it is possible to alter the inductance and consequently the frequency to which the coil is tuned. By careful adjustment using a non-metallic alignment tool, it is possible to get each circuit tuned to the same frequency, which in this instance is 455 kHz. A signal generator set to 455 kHz is attached to the aerial terminal of the receiver and the level adjusted until the generator output is heard in the receiver output. It may be necessary to adjust the frequency of the signal generator to find out what the IF transformer has been tuned to, before being put into the set. The 455 kHz signal from the average signal generator will be strong enough to be passed through the converter stage, although it is not designed to pass this frequency.

The IF transformer is aligned with the regenerative detector set well below the point of oscillation, that is with the moving arm of R59 near to the earthy end of its travel.

The signal from V4 is coupled across L14 to L15 and fed to the grid of V5 via C66 the grid blocking capacitor. The operation of a regenerative IF-Detector has to be considered in more than one way as several functions occur in the one stage using common components. The signal presented at the grid of V5 is rectified as the valve is operated with no bias. The grid and cathode act as a diode detector with R61 the grid leak as the load.

Assuming that the transmission being received is AM, the DC voltage developed across R61 will depend on the strength of the signal, and the AC component (audio) is impressed on to the DC component. The audio component is, in fact, varying the bias developed on the grid of V5. When the voltage becomes more negative due to a negative audio peak, the valve draws less current and the voltage at the plate becomes more positive. When the bias is varying — due to the audio component — in a positive or less negative direction, the valve draws more current, therefore the voltage at the plate of V5 drops. It will be noted that when the grid voltage goes in a negative direction, the plate voltage goes in a positive direction, which indicates that the plate and grid circuits are 180 degrees out of phase.

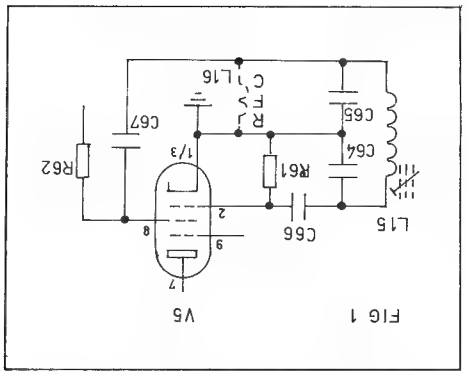
The screen grid is held at audio frequency earth by C67, although this capacitor has an additional function at RF frequencies. The variations of current in the plate circuit cause the voltage across R63 to vary quite considerably at audio frequency, although this will not be evident on the DC plate voltage readings. This variation in voltage is coupled via C68 to the remainder of the receiver. This is how a non-regenerative detector works — now to show how the regenerative section works.

If the circuitry in Fig 1 of this issue is looked at closely, it will be seen that V5 is wired as a Colpitts oscillator — as in the original circuit (May 1976) but redrawn here for clarity — the screen being used as the plate of the oscillator. The actual earthy or common point with reference to earth is unimportant and could even be the grid in some circumstances.

Consider that the cathode of V5 is the common point in the function of the oscillator. The screen and grid are connected at opposite ends of L15 and therefore will have a phase difference of 180 degrees to each other, a condition which is conducive to oscillation. A positive-going voltage on the screen will cause the voltage on the grid to be negative-going, which tends to cut the valve off. This means that the screen voltage will increase further, so causing a higher negative voltage to be developed at the grid. This continues until the valve is cut off, and will continue still further until the energy stored in the magnetic field of L15 is transferred to the two capacitors C64 and C65. When this occurs, the phase across L15 changes and the grid of V5 starts to become less negative, whilst voltage on the screen starts to decrease. Soon the grid will become positive, the screen drawing as much current as possible, and the inductor L15 endeavouring to lower the screen voltage. C64 and C65 will be charged to a maximum voltage with the grid end of C64 being the most positive. The inductor having given its energy to the capacitors now starts to draw current from them, thereby reducing the positive bias on the grid and hence the current being drawn by the valve. At the opposite end of L15 the negative voltage is diminishing so the voltage on the screen is increased. This continues until the voltage on the grid becomes quite negative and the screen voltage endeavours to go progressively more positive to maintain current flow through the valve.

Eventually, the valve is cut off and the whole cycle starts again. The variations in the screen current cause the valve to stay in oscillation supplying the energy to make up for that dissipated in the circuit losses. It might be noted that the valve draws grid current when the oscillatory action swings the grid positive with respect to the cathode.

Under normal conditions, a regenerative detector (in this instance a Colpitts oscillator) is not run in the oscillating condition. It will be seen that the capacitive divider formed by C64 and C65 taps the cathode very close to earth (see circuit May 1976). The feedback is extremely small, so small in fact that the oscillator does not oscillate readily. The point at which the circuit starts to oscillate is controlled by R59 which varies the screen voltage and the valve amplification. Consider that the circuit is just below the point of oscillation. When this is so the RF energy applied to the grid of V5 is amplified by V5 and reapplied in such phase at the earthy end of L15 to bolster the original signal. This positive feedback also increases the Q of the tuned circuit which, therefore, becomes much more selective, being only about 10 kHz wide for many dB



Colpitts Oscillator-Regenerative Detector

down in response. The amplified version of the original RF signal is now detected and comes out as audio from the plate circuit at a level considerably higher than if regeneration were not used.

With the regeneration control set just below oscillation, the receiver does a good job on AM signals. When the detector is oscillating, which occurs when the voltage on the screen is increased, the detector is ideal for detecting CW and SSB. The regenerative detector oscillations beat against an incoming CW signal to give a pleasing tone, or in the case of SSB to give intelligible speech. It is possible to receive AM signals with the detector oscillating and in some circumstances the oscillator will lock to the frequency of the incoming carrier, and slight variations in receiver tuning will not be apparent due to this effect.

L16 is used to isolate the cathode of V5 above RF earth so that the grid and screen may appear at opposite ends of L15 and allow the cathode to form a tap on L15 via a capacitance divider. It permits the cathode to be at earth potential for audio and DC.

The next part will deal with the audio amplifier.

ERRATA

Page 14, May issue, pin 5 of 6BL8, pin 5 of 6BX6, plus 4 and 5 of 12AH8 and the junction of R51 right hand end should all be joined together. C74 should have a + marked above upper plate. C62 should be wired to one terminal of the IF transformer not some distance away as the diagram might infer. Voltage at pin 5 of V7 is 150 volts. 250 volts on line to plate of V4, pin 6. ■

COMMERCIAL KINKS

Ron Fisher, VK3OM
3 Fairview Ave.,
Glen Waverley, 3150

LOOKING AT THE KENWOOD/TRIO TS520

The TS520 was first advertised in Australia in the September and October 1974 issues of Amateur Radio at a price of $500 which at that time included the matching external speaker. At that time many amateurs were somewhat suspicious of the 520 due to the vagaries of the preceding models, the TS500 and the TS510. However the suspicion proved unfounded and the 520 has become a popular and accepted rig for Australian Amateurs. Perhaps proof of this acceptance is the fact that few if any modifications have so far been published. One or two articles on it have appeared in overseas magazines but these have all described additions to the rig in the way of ancillary circuits rather than actual modifications.

In Commercial Kinks this month two different ideas will be described. They are not really modifications, but rather methods of using the 520 somewhat better under Australian conditions.

Les Daniels VK2AXZ came up with the first one.

The original AC connections on the TS520 is for 220 volts rather than 240 volts, and this puts about 1200 volts on the plates of the 6146s.

After making the change to be described, this drops to about 900 volts under static conditions and also produces a more normal voltage on the tube filaments and dial lamps. The method is simple. Remove the cabinet as shown on page 38 of the TS520 instruction manual and locate the power transformer. If you want to check beforehand it is clearly pointed out in the bottom view photo on page 49. With the set upside down and the front panel facing you, find the royal blue wire going to the 100 volt tap of the transformer right hand side. Cut this off as close as possible to the tag, then strip back the insulation ¼ inch and resolder it to the 120 volt tapping, which is the next one towards the front.

Don't imagine that you might get more output with the higher voltage. The power output remains the same with the lower setting but you will get much longer life from the tubes and electrolytics.

Thanks to Les for passing this idea on which originated from Barry VK2ACI.

It also appears that the importers of the 520 may be now making this modification before sending the set to the various distributors. To check, just set the meter switch to HV, put the transmitter on air in the sideband position. If the voltage indicates 1000 or more you will need to carry out the above modification.

The next one was brought to our attention by Phil Williams VK5NN. It seems that the 520 can produce a spurious output when operating on the 14 MHz band. The mechanism of the spurious output signal is as follows:

$(2 \times VFO) + IF = XTAL - IF - VFO.$

Solving this as follows:

$2 \times VFO + 3.395 = 22.895 - 3.395 - VFO.$

$$\text{Thus } VFO = \frac{22.895 - (2 \times 3.395)}{3}$$

$$= 5.3683$$

The spurious and wanted signal cross over at 14.13166 MHz.

If trouble occurs it is found that the spurious signal is about 45 dB down and in the CW section of the band (14.095 MHz) when transmitting on about 14.150 MHz. The answer to the problem is to readjust L5 on the VFO board.

See figure 21 on page 35 of the 520 instruction manual. This should be set for maximum suppression at about 10.7 MHz. It appears that this filter is set in the factory assuming that the transceiver will be used above 14.2 MHz as in the United States. Repeaking L5 will suppress the unwanted signal to better than 65 dB down in the portions of the band used by Australian amateurs.

Phil notes that when using 520 barefoot there is usually little trouble. But with a linear and a beam a 45 dB down signal can come up to the point of annoying many locals or interstate stations on short skip.

To conclude Phil poses a question. Diode D4 on the RF board causes cross modulation by strong signals on 80 metres. Can anyone suggest a good alternative with a higher conduction voltage or another solution to the problem.

Well, I have never noticed the effect that Phil mentions. If you have, and have found a cure for it, please let us both know. ■

IARU NEWS

To find anything to follow VK3KI's article in June AR page 6 is extremely difficult.

One way is to reiterate his last comment "we cannot be complacent about the future".

There can be little doubt that Intruder Watch activities by amateurs will have some bearing on WARC79. A recent issue of the Indian Radio Amateur indicates an awakening of Intruder Watch activities in that country.

Amateurs not only need to do everything they can to keep the bands they now posses but also need to be alter in reporting, and keep on reporting, intruders found within those bands.

Whilst researching another project recently, it was interesting to note the correspondence which went on with the PMG as long ago as 1953/54 about Radio Pakistan on 7010 kHz and the PMG's statement in one letter of the time which rea "While this Administration cannot, of course, condone the use of Amateur channels for broadcasting purposes, in view of all the circumstances, it is considered that the assurance given by Pakistan that it will vacate the channel and, until doing so, will limit operation to times unlikely to affect seriously the activities of Australian amateurs represents a reasonably satisfactory compromise which should prove acceptable to the Institute"

To quote a comment from QST of April 1976, "Just as eternal vigilance is the price of democracy, it is also the price of having uncluttered ham bands". This comment was made about unlicensed SSB stations operating between the 11m and 10m bands.

Also from this issue of QST comes the timely reminder that reciprocal licensees operating in the US must observe the US phone sub-allocations, as well as other FCC regulations pertaining to amateur radio. The converse is also true — the reminder continues — that FCC licensees operating in other countries must abide by the regulations of the host government which issues them operating permission. It need not be stressed perhaps that these principles apply to all reciprocal licence operations.

According to QST for April 1976, Richard L. Baldwin, W1RU became Secretary of the IARU as well as of the ARRL at the 1976 AGM of ARRL and succeeds John Huntoon, W1RW in that post. ■

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3.16	¾	16	3	No. 3011	**$1.40**
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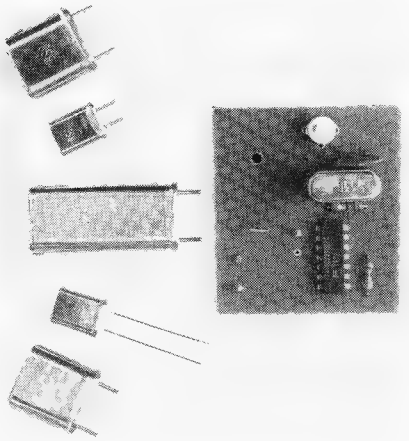

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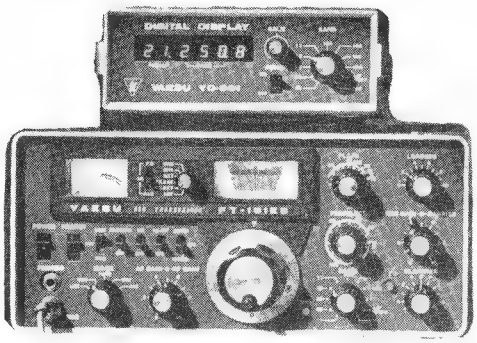

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GUIDELINES FOR AMATEUR RADIO OPERATION IN THE 80, 15 and 11 METRE BANDS

1. The 11 m amateur band for Australia extends from 26.960 MHz to 27.230 MHz. (It is also allocated for amateur use in New Zealand and Region 2 (the Americas)).

2. The band 26.100 MHz to 27.500 MHz is allocated internationally to the **Fixed and Mobile** except aeronautical mobile) services. This is applicable to Australia also. These stations operate (without callsigns) on specifically assigned fixed frequencies.

3. The frequency 27.120 MHz (+ or —0.6%: i.e., plus or minus 162.72 kHz — effective permissible limits therefore extend from approximately 26.957 MHz to 27.283 MHz) is designated for ISM **(industrial, scientific and medical)** purposes and all services operating within the permissible limits must accept any harmful interference from ISM equipment operating on the frequency stated.

4. In accordance with ITU Radio Regulations — article 5, RR 142 and 143 — the Amateur Service in Australia may use the 11 m allocation with **equality of right** to operate with any stations in the fixed and mobile (except aeronautical mobile) services.

5. **Amateur Novice licensees** may lawfully operate wholly within the 11 m amateur band allocation. By a gentleman's agreement they should not use telephony in the segment 26.960 MHz to 27.030 MHz; **this segment is reserved by amateurs for CW operations only.**

6. In the fixed and mobile services allocations the **Radio Control of model aircraft, boats, etc.** may use the band 26.957 to 27.282 MHz. The frequency band 27.230 to 27.280 MHz is allocated to **licensed portable hand-phone users** (commonly used frequency 27.240 MHz). 26.978 MHz and 27.212 MHz are allocated for **licensed radio paging operations.** There are other allocations for other purposes both above and below the amateur band. There are also other fixed services which can use this band on fixed frequency assignments.

7. Because the 11 m band is allocated for use by a number of services on an equal footing **it is imperative that amateur operators must first ascertain that the frequency they intend** to use is free and is not in use by any other legally authorised user. Amateurs should also remember that other communication services sharing the band will normally have only one operating frequency and will be unable to shift if it is occupied by an amateur.

8. It is known that the use of this part of the spectrum is favoured by unlicensed or 'pirate' operators. These operators are intruders and should be treated as such. Be very careful indeed that a transmission really is that of an intruder before finding it necessary to select that particular frequency on which to operate your own transmitter in accordance with the conditions set out in the "Handbook for operators of radio stations in the Amateur Service". Be sure to QSY if asked to do so by a legitimate fixed frequency station. Many low powered primary services operating within the band have not been allocated callsigns and may, therefore, be using local identifications similar to those used by 'pirate' operators.

9. If it is at all possible you should do everything you legally can to identify the intruder and determine his location. All available details should be reported quickly to the WIA. Intruder Watch Co-ordinator and copy your report to your local Regulatory and Licensing Branch of the Radio Frequency Management Division, Postal & Telecommunications Department. You are not entitled to take any other action, except those set out above, when you find there is an intruder in any amateur band including the 11m band. Be sure to avoid having any contact with an intruder.

10. If (by the nature of the words used or matter discussed etc.) you suspect that a station is operating with an amateur callsign which is not likely to have been authorised by the rightful owner of that call sign you should make a report on the same lines as in paragraph 9 above. If you can first contact the rightful owner of the callsign to confirm your suspicions so much the better.

11. Except for properly authorised emergency traffic, amateurs are not permitted to make contact on the air with non-amateur stations (including Citizens Band, etc.).

SUPPLEMENTARY INFORMATION

A. **Radio control of model aircraft** frequencies in common usage indicate that their Channel 1 is 26.995 MHz, Channel 2 — 27.045 MHz, Channel 3 — 27.095 MHz, Channel 4 — 27.145 MHz, Channel 5 — 27.195 MHz and Channel 6 — 27.245 MHz. Intermediate channels are Channel 1½ — 27.020 MHz, 2½ — 27.070, 3½ — 27.120, 4½ — 27,170, 5½ — 27.220 and 6½ — 27.270. Interference to model aircraft transmissions could cause the model aircraft to crash with disastrous results to an expensive machine and possible hazard to anyone on the ground beneath the crashing model.

B. **Radio control of model boats** frequencies believed to be commonly used begin at 26.975 MHz increasing 20 kHz per channel to 27.255 MHz — i.e., 26.975, 26.995, 27.115, 27.135, 27.155, 27.175, 27.195, 27.215, 27.235, 27.255 MHz.

C. **USA Citizens Band channels.** Channels 1 to 22 are within the Australian 11m Amateur band. Channel 1 is 26.965 MHz, 2 — 26.975, 3 — 26.985, Channel 4 is 27,005 and the next 3 are each 10 kHz higher in frequency — i.e., 27,005, 27,015, 27,025 and 27.035. Channel 8 is 27.055 with the next 3 in 10 kHz increments higher, Ch. 12 is 27,105 with 13 to 15 each 10 kHz up, Ch. 16 is 27.155 with 17 to 19 each 10 kHz up, Ch. 20 is 27.205, 21 — 27,215 and 22 — 27.225 MHz.

D. The New Zealand "Citizen Band" frequencies are all outside (below) the Australia 11m amateur band.

ADDITIONAL NOTES FOR AMATEUR OPERATORS IN THE 15 AND 80 METRE AMATEUR BANDS.

1. The 80 metre Amateur band in Australia extends from **3500 to 3700 kHz** and the 15m band from **21000 to 21450 kHz.** The band 21000 to 21450 is also allocated to the Amateur Satellite Service.

2. These two bands, in Australia, are **exclusively** Amateur bands.

3. In the ITU Regulations only the band 21000 to 21450 kHz is allocated exclusively in all Regions to amateurs. In the 80m band the ITU allocations for all Regions extend from 3500 to 3800 kHz but in Region 3 extend up to 3900 kHz and in Region 2 (the Americas) up to 4000 kHz. In all the three Regions these bands are allocated to Amateur, Fixed and Mobile (except Aeronautical mobile in Regions 1 and 2) on an equal basis.

4. In Australia, the band 3700 to 3900 kHz is allocated to the Fixed and Mobile Services.

5. **In India** the Amateur band on 80m extends from 3890 to 3900 kHz and the band 3500 to 3890 kHz is allocated to the Fixed and Mobile Services. In New Zealand the 80m Amateur band extends from 3500 to 3900 kHz as it does in many other countries. In Indonesia amateurs share the band with other services and in Japan the Amateur band is 3500 to 3575 and 3793 to 3802 kHz.

6. By an Amateur Service gentlemen's agreement the segments for **CW operation only** extend from 3500 to 3535 kHz and 21000 to 21150 kHz. The remainder of these Amateur bands may be used for both phone and CW operations. RTTY frequencies are 3620 kHz and 21090 kHz.

7. Australian Novice Licensees are permitted to operate within the segments 3525 to 3575 kHz and 21125 to 21200 kHz in accordance with licensing conditions applicable to them (i.e., crystal-controlled transmitter with power not exceeding 10 W Pm (30 W Pp in the case of A3A or A3J modes) with types of emission A1, A3, A3A, A3B, A3H, A3J and F3 + 3 kHz).

8. In accordance with an Amateur gentlemen's agreement for band sharing, the following are the **CW only** segments for Novice licensees:— 3525 to 3535 kHz and 21125 to 21150 kHz. In the segments 3535 to 3575 kHz and 21150 to 21200 kHz Novice licensees may operate on phone or CW.

9. **Words of caution to Novice licensees:**

(a) Like every amateur, listen on your frequency and ensure it is unoccupied before transmitting. (Note: Most amateurs listen very much more than they transmit);

(b) Do please adhere to good amateur practices and observe the Amateur's Code (see AR June '74 p. 8 or any ARRL Handbook);

(c) Be careful to ensure that the entire signal you transmit, inclusive of sidebands, falls **within** the permitted band segments;

(d) These two bands are international DX bands and you can therefore expect to contact overseas stations when conditions are right — the better your antenna system the greater will be your chances of working DX, other things being equal. Be careful therefore to QSY if another amateur asks you because he is working a weak DX station on the frequency and maybe you cannot hear it at all. This could occur on a 3528 kHz net frequency especially.

10. **Intruders.** If intruders are heard on the 80m or 15m bands the same procedures apply as already stated for the 11 metres band. Late at night on 80m you may hear masses of strange signals but most of these may be quite legitimate if they derive from countries overseas where this portion of the band is not exclusively amateur.

11. Because of the DX capabilities of the 80 and 15 metre bands it is better to confine cross-town contacts to the higher frequency bands when the lower frequency bands are open for DX working. Remember too that if you operate **mobile or portable** on any band you must have your licence (or proper photocopy of it) with you — see para. 44 of the Handbook for Amateur Operators; this also assists with identification if you are stopped for checks. Also take care that if you have a rig fixed in your car (etc.) and the car is used by someone else (your XYL or friend) the rig should be disconnected or disabled whilst that other person has use of the vehicle. ■

CONTESTS

Kevin Phillips, VK3AUQ
Box 67, East Melbourne, 3002

CONTEST CALENDAR

July
- 3/4 Venezuelan Phone Contest
- 17/18 Colombian Contest
- 17/19 County Hunters CW Contest
- 24/25 ARRL Bicentennial
- 31/Aug. 1 Venezuelan CW Contest

August
- 14/15 REMEMBRANCE DAY CONTEST
- 14/15 European CW
- 28/29 All Asian CW Contest

September
- 11/12 European Phone Contest
- 18/19 Scandinavian CW Contest

Colombian Contest

0001 GMT July 17 to 2359 GMT July 18

Exchanges will be on a world wide basis on all bands 3.5 to 28 MHz. Phone and CW. There are three classes, single operator, single band and all band, multioperator single transmitter. Exchange RS(T) plus a 3 figure number starting with 001.

Scoring: QSO's with HK's 5 points, North American stations 3 points, other countries 2 points and with same country 1 point. The multiplier is determined by the sum of DX countries worked on each band. Final score is sum of QSO points from all bands multiplied by the sum of different countries worked on each band.

Award winners must have at least 50 QSO's on log. Use separate log sheet for each band. Include summary sheet and declaration with logs. These must reach LCRA, Concurso Independencia, Apartado, Postal 584, Bogota, Colombia, by the 30th Sept. 1976.

Country Hunters CW Contest

0000 GMT July 17 to 0600 GMT July 19

Exchange QSO No., category, (F-fixed, P-portable, M-mobile) RST, state, province or country, and county for US stations.

Scoring: QSO's with fixed stations 1 point, 3 points for portable and mobile stations. Multiply total QSO points by number of US countries worked.

Mobile and portables calculate their score for contacts made within a state.

Frequencies: 3575, 7055, 14070, 21070, and 28070.

Logs must be sent to CW County Hunters Net, c/o Jeffrey P. Bechner, W9MSE, 673 Bruce Street, Fond de Lac, Wisc. 54935, by September 1st.

REMEMBRANCE DAY CONTEST 1976

The rules for this year's contest are basically the same as last year, as there was an increase in the number of logs received. The only change concerns the calling procedure of "Substitute Operators". Previously substitute operators called on phone "CQ RD" followed by the call of the station they are operating, then the word "log" followed by their own callsign, e.g., "CQ RD from VK4BBB log VK4BAA", and on CW it is "CQ RD de VK4BBB/VK4BAA". This may lead to confusion as a station who hears the call may log the wrong call i.e., VK4BBB. As no station other than the substitute operator requires to even know of VK4BBB's existence in this example, it seems unnecessary to send it at all. This year, substitute operators will only use their own callsigns and put in a log for their own operation.

Contest Champion Trophy

The RD Contest is the second contest from which points are awarded towards the trophy. The first for this year was the National Field Day 1976. I hope to produce a list with points counting towards the trophy next month. The trophy was donated by Peter Brown VK4PJ to encourage participation in our VK contests, and is worth trying for. It is a perpetual trophy and will have the winner each year engraved on it.

All Asian CW Contest

The date for this contest has been changed since last month — it is now on 28-29th August. Other rules remain the same, but there are awards for each single band this year. ■

1976 REMEMBRANCE DAY CONTEST

RULES

A perpetual trophy is awarded annually for competition between Divisions of the Wireless Institute of Australia. It is inscribed with the names of those who made the supreme sacrifice and so perpetuates their memory throughout Amateur Radio in Australia.

The name of the winning Division each year is also inscribed on the trophy and, in addition, the winning Division will receive a suitably inscribed certificate.

OBJECTS

Amateurs in each VK call area, will endeavour to contact other amateurs:—

1. In other VK call areas, P29 and ZL on all bands 1.8 through 30 MHz.

2. In any VK call area (including their own) P29 and ZL on authorised bands above 52 MHz and as is indicated in rule 5.

CONTEST DATE

0800 hours GMT on Saturday 14th August 1976 to 0759 hours GMT on Sunday 15th August 1976.

All Amateur stations are requested to observe 15 minutes silence before the commencement of the contest on Saturday afternoon. An appropriate broadcast will be relayed from all Divisional stations during this period.

RULES

1. There shall be 4 sections to the Contest:
   (a) Transmitting Phone
   (b) Transmitting CW
   (c) Transmitting Open
   (d) Receiving Open

2. All Australian amateurs (VK callsigns) may enter the contest whether their stations are fixed, portable or mobile. Members and non-members of the Wireless Institute of Australia are eligible for awards.

3. Amateurs may use these modes:
   (a) Phone
   (b) CW
   (c) RTTY
   (d) SSTV

However, only one entry may be submitted for sections (a) to (c) in rule 1. An open log is one where points are claimed for more than one mode. AM, SSB and FM are grouped as one mode, i.e., Phone.

4. Cross mode operation is permitted but both stations may only claim points as for a phone/phone contact. Cross band operation is not permitted, excepting via a satellite repeater.

5. **SCORING**

(a) On the 3.5, 7 and 14 MHz bands a station in another call area may be contacted once on each band using each mode. That is you may work the same station on each of these bands on Phone, CW, SSTV or RTTY.

(b) On the 1.8, 21, 27 and 28 MHz bands a station in another call area may be contacted twice on each band using each mode provided that not less than 12 hours has elapsed since the previous contact on that band using that mode.

(c) Between 1600 hours GMT and 2100 hours GMT on Saturday, intra call area contacts may be made on the 1.8, 7, 21, 27 and 28 MHz bands once for each mode on each band.

(d) Between 0300 hours GMT and 0759 hours GMT on Sunday, intra call area contacts may be made on 1.8, 21, 27 and 28 MHz bands, once for each mode on each band.

(e) On the bands 52 MHz and above, the same station in any call area may be worked using any of the modes listed in rule 3 at intervals of not less than 2 hours since the previous same band/mode contact. However, the same station may be contacted repeatedly via satellite not more than once by each mode on each orbit.

(f) All CW/CW, SSTV and RTTY contacts count double. Note rule 4 re cross mode contacts.

6. Multi licenced operator stations are not permitted. Although log keepers are permitted, only the licenced operator is allowed to make a contact under his own callsign. Should two or more licenced operators wish to operate any particular station, each will be considered as a contestant and must submit a log under his own callsign.

7. Club stations may be operated by other than licenced members and contacts credited to the Club station callsign. Rule 6 applies to the licenced operator in attendance. All operators must sign the declaration.

8. Entrants must operate within the terms of their licence.

9. **CYPHERS.** Before points may be claimed for a contact, serial numbers must be exchanged and acknowledged. The serial number of 5 or 6 figures will be made up of the RS (telephony) or RST (CW) reports plus 3 figures that will be incremented by one for each successive contact. If any contestant reaches 999, he will start again with 001.

10. **ENTRIES.** Must be set out as shown in the example, using one side of the paper only and standard WIA log sheets if possible. Entries must be clearly marked "Remembrance Day Contest" on the envelope, and must reach the Federal Contest Manager, WIA, Box 67, East Melbourne 3002, in time for opening on Friday 17th September, 1976. Early submission of logs will be appreciated.

11. **TERRESTRIAL REPEATERS.** Contact via terrestrial repeaters are not permitted for scoring purposes. However, contacts may be arranged through the repeater and if successful on another frequency, that contact counts for scoring purposes.

12. **PORTABLE OPERATION.** Log scores of operators located outside their own call area will be credited to that call area in which operation takes place, e.g., VK5XY/2. His score is added to the VK2 scores.

13. **ALL LOGS** shall be set out as in the example shown and in addition **MUST** carry a front sheet showing the following information:
   Name
   Address
   Section
   Callsign
   Claimed score
   Number of contacts
   Modes used
   Declaration: "I hereby certify that I have operated in accordance with the rules and spirit of the contest".
   Signed
   Date

All contacts made during the contest must be

SCORING TABLE FOR PHONE CONTACTS — ALL CW/CW, SSTV and RTTY CONTACTS COUNT DOUBLE

From	To 0	1	2	3	4	5	6	7	8	9	P29	ZL
VK0	—	6	6	6	6	6	6	6	6	6	6	2
VK1	6	—	1	1	2	3	5	4	6	5	5	2
VK2	6	3	—	1	2	3	5	4	6	5	5	2
VK3	6	4	1	—	2	1	4	3	6	5	5	2
VK4	6	3	1	2	—	3	6	5	4	3	3	3
VK5	6	5	2	1	3	—	4	3	3	6	6	4
VK6	6	6	2	1	4	2	—	3	5	6	6	4
VK7	6	5	1	1	3	2	5	—	5	6	6	2
VK8	6	5	1	1	2	3	6	4	—	3	3	4
VK9	6	5	3	3	3	4	5	6	3	—	6	5
P29	6	5	3	3	4	4	5	5	5	6	—	5
ZL	6	5	3	3	4	4	5	5	5	6	5	—

Read table from left to right to work out points for the various call areas.

ALL INTRA-CALL AREA CONTACTS ON 52 MHz AND ABOVE, OR AS INDICATED IN RULES 5(c), (d), and (e) are worth one point.

EXAMPLE OF TRANSMITTING LOG

Date/time GMT	Band	Mode	Callsign worked	RS(T) sent	RS(T) rec'd	Points

EXAMPLE OF RECEIVING LOG, VICTORIAN SWL

Date/time GMT	Band	Mode	Callsign heard	RS(T) sent	Station called	Points
14 Aug 76						
0612	7	P	VK5PS	58002	VK6RU	1
0615	7	CW	ZL2AZ	559004	VK4KI	4
0618	14	P	VK0ZZ	57006	VK6FI	6
0624	14	P	VK6FI	58004	VK0CB	4
1620	28	P	VK3WI	59077	VK3ZZ	1
15/0750	1.8	CW	VK3YQ	599360	VK3XU	2
0754	52	P	VK3YXX	58137	VK3ZXX	1

Note times for intra call area loggings shown in rule 5.

shown in the log submitted. If an invalid contact is made, it must be shown, but no score claimed. Entrants in the "Open" section must show the various mode contacts in numerical, i.e., chronological order.

14. The Federal Contest Manager has the right to disqualify any entrant who during the contest, has not observed the regulations or has consistently departed from the accepted code of operating ethics. The Federal Contest Manager also has the right to disallow any illegible, incomplete or incorrectly set out logs.

15. The ruling of the Federal Contest Manager of the WIA is final and no disputes will be entered into.

AWARDS

Certificates will be awarded to the top scoring stations in sections (a) and (c) of rule 1, in each call area, and will include the top scorer in each section of each call area operating exclusively on 52 MHz and above. Each VK, ZL and P29 call area will count as separate areas for awards. There will not be an outright winner. Further certificates may be issued at the discretion of the Federal Contest Manager. The Division to which the Remembrance Day Trophy will be awarded shall be determined in the following way:

Average of top 6 logs plus (number of logs entered divided by the number of call area licences, multiplied by total points from all entrants from call area in sections a, b and c).

VK0 scores are added to VK7 and VK8 to VK5. Scores by VK9 stations are added to the mainland call area geographically nearest. Scores claimed by ZL and P29 stations are not included in the scores of any VK call area.

Acceptable logs for all sections shall show at least 5 valid contacts. The trophy shall be forwarded to the winning Division in its container and will be held by that Division for the specified period.

RECEIVING SECTION (Section d)

1. This section is open to all Short Wave Listeners in Australia, Papua New Guinea and New Zealand, but no active transmitting station may enter.

2. Contest times and loggings of stations on each band are as for transmitting.

3. All logs shall be set out as in the example. It is not permissible to log a station calling "CQ". The detail shown in the example must be recorded.

4. Note the times and conditions set out in rule 5.

5. Club stations may enter this section. All operators must sign the declaration.

AWARDS

Certificates will be awarded to the highest scorers in each call area. Further certificates may be awarded at the discretion of the Federal Contest Manager. ■

VHF-UHF AN EXPANDING WORLD

Eric Jamieson, VK5LP
Forreston, 5233

VK0	**VK0MA, Mawson**	**53.100**
	VK0GR, Casey	**53.200**
VK1	**VK1RTA, Canberra**	**144.475**
VK2	**VK2WI, Sydney**	**52.450**
	VK2WI, Sydney	**144.010**
VK3	**VK3RTG, Vermont**	**144.700**
VK4	**VK4RTL, Townsville**	**52.600**
	K4RTT, Mt. Mowbullan	**144.400**
VK5	**VK5VF, Mt. Lofty**	**53.000**
	VK5VF, Mt. Lofty	**144.800**
VK6	**VK6RTV, Perth**	**52.300**
	VK6RTU, Kalgoorlie	**52.350**
	VK6RTW, Albany	**52.950**
	VK6RTW, Albany	**144.500**
	VK6RTV, Perth	**145.000**
VK7	**VK7RMT, Launceston***	**52.400**
	VK7RTX, Devonport	**144.900**
VK8	**VK8VF, Darwin**	**52.200**
3D	**3D3AA, Suva, Fiji**	**52.500**
JA	**JD1YAA, Japan**	**50.110**
ZL1	**ZL1VHF, Auckland**	**145.100**
ZL2	**ZL2MHF, Upper Hutt**	**28.170**
	ZL2VHP, Palmerston North	**52.500**
	ZL2VHF, Wellington	**145.200**
	ZL2VHP, Palmerston North	**145.250**
	ZL2VHG, Palmerston North	**431.850**
ZL3	**ZL3VHF, Christchurch**	**145.300**
ZL4	**ZL4VHF, Dunedin**	**145.400**

***denotes addition.**

A telephone call from Joe VK7ZGJ this month proudly announced to me that the Launceston six metre beacon was at last granted a licence and was operational. It is operating on a continuous schedule with 850 Hz FSK, with an ident every 20 seconds. It is running about 25 watts to a half wave dipole orientated north and south. It is very pleasing to see another beacon on the air, further filling the gaps in the Australasian beacon coverage. It is to be hoped that eventually a decision may be made to instal a cloverleaf or similar type of antenna to give an available signal in all directions, the back of the antenna supplying information on short skip conditions to Hobart, and the remainder providing information to VK6 to the west, ZL to the east and the remainder of VK in between. Joe would be very pleased to receive any reports of reception of the beacon.

Under the heading of "Observations" in the Eastern Zone (Gippsland area) Newsletter of VK3, there is a brief comment that an application has been made for a two metre beacon for that area.

I note also that Joe VK7ZGJ made a comment in his VHF notes in "QRM" that a 432.475 MHz beacon has been approved for the North West coast area of Tasmania, and will be in operation shortly. A beacon placed there should be a lot of interest to many people, particularly those in Mt. Gambier and VK5 generally, and the Albany boys. Providing there is some amateur activity available to back it up, it could prove interesting when band conditions are right, and provide another State on 432 for many. I am particularly pleased to note the frequency has been placed towards the upper end of the first 500 kHz segmnt of the 432 MHz area, close enough to be remembered for monitoring purposes, but far enough away not to cause problems for low end of the band operation, and right away from the EME segment which is now extending up to 432.050.

The Townsville Amateur Radio Club notes that Graham P29DJ calls most nights on 144.100 with CW from 1000Z. Provided Graham has a reasonable take-off south, there seems to be no real reason why he should not eventually be heard in the northern parts of Queensland, if not elsewhere. I am not sure what the distance would be between Graham and Townsville for instance, but I would not think it to be any further than say from Adelaide to Albany, approx. 1920 km or 1200 miles and over water most of the way. If I lived in Townsville I would certainly be doing my utmost to cover that distance.

Just back to beacons again for a moment, it is of interest to note in the WA VHF Group Bulletin that a readout of the operating frequencies of the two Perth beacons on 21/4/76 gave them as 52.300109 and 145.0003130 MHz, which indicates a rather precise frequency stability for each beacon. Has anyone else read theirs lately?

Further to my note in May issue regarding 2 metre activity in Broken Hill, I have received a letter from John VK2ZXU from that city advising that activity is not great up there, with the only really active station being Frank Bridgewater (call unknown) on 2 metres FM. John mentions he VK2ZXU, would one day like to operate again on the lower part of 2 m, but as he puts it "With something better than his old AM rig!" Talking with Ray VK3ATN one night he mentioned VK2ZI was supposed to have a 70 watt linear amplifier for two metres. Perhaps these few lines will help to spark a bit of fresh interest in the Broken Hill area, after all it is only 480 km from Adelaide and about 900 km from Melbourne. Both should be CW contacts, and SSB under the right conditions.

On 432 MHz Ray VK3ATN has launched into some renewed activity, particularly employing his EME dish for that band. Good results have been obtained with Les VK3ZBJ in Melbourne, and with Chris VK5MC in Mt. Gambier. Ray also has a good 2 metre path to Les and contacts seem to be available almost at any time.

Six metres has been rather quiet of late. Most uses the band is put to these days in VK5 is for crossband contacts to 2 metres. Many summer time sporadic E operators will be sorry to learn that Kerry VK5SU has packed up his bags after making his last contact from Ceduna on 29/5/76 and left to take up work at Moree in Northern NSW. Kerry was situated in a prime position for 6 metre DX to everywhere, as evidenced by the number of times he won the Ross Hull Memorial Contest. Of latter times he turned his hand to 144 and 146 MHz with results in keeping with the distance he was situated from centres of population, but a nice half way point for the boys in Albany. I am sure we all wish Kerry every success with both his work and amateur radio from his new location; he may find it more difficult to grab as many contacts there as he did in Ceduna, but time will prove if this is so. Anyway, he will be a great asset to NSW and should be able to work into Brisbane from Moree on 2 m, and will come within the occasional range of 6 metre stations in Japan via F2 conditions. Will be pleased to hear from you Kerry sometime when you get settled in.

From the pages of "The Propogator" comes information that the W/VE/JA segment of the April EME tests were carried out by Charlie VK2ZEN, with the able assistance of Charles VK2MT on the CW side. Results were quite good, with first time contacts being made with W4NUS and VE4JX. Contacts were also made with VE7BBG and JA1VDV.

The May EME tests were to include those with WA6LET, of the Stanford Research Institute using their 150 foot dish on 432.095. Most of the time the tests would be conducted with their normal power of 1 Kw input, but some tests were scheduled for an output power of 20 Kw if permission could be obtained from the FCC. Moonrise for these tests at VK2AMW would be 1615Z or 0215 EAST, so hope Lyle and his helpers were able to get some results from that one.

Others to take part in these high power tests included VK3ATN, VK5MC, VK5MT, VK5NY and VK5ZPS. These are the operators I know about at this stage, many others probably had a listen. Ray VK3ATN reports hearing WA6LET at up to 6 dB above noise at times, with good CW copy, but he thought the signal was weaker than the November tests. He copied the first readable signal at 1737Z, signals 3 x 2, consistent though weak.

Chris VK5MC listened using 4 yagis, signals reasonable it is reported. Roger VK5NY heard the signals 3 to 4 dB above the noise on his 32 element extended expanded collinear array, first hearing WA6LET at 1722Z at an elevation of 1½ degrees. At this stage unable to get anything definite from the other operators.

In talking to Roger VK5NY he reports the good news that Western Victoria will again be coming into the news with some fresh SSB operation on 144 MHz. Ray VK3AV is operating on 144.100 each Sunday morning at this stage looking toward Adelaide following the WIA broadcast which concludes around 0000Z. Ray is located at Horsham. Alan VK3ZFJ has moved from Melbourne to N[illegible] and is setting himself up for 144 and 432 M[illegible] SSB. Both these stations should be audible in Adelaide and Melbourne, so other operators should keep them in mind.

A late note has come to hand from Allan VK4RF in Brisbane which mentions six metres opening up on 26/5 for the first time since 8/2/76 when he worked VK3AQR at 0235Z, 5 x 9 both ways. Later at 0400Z VK5VF the SA beacon was heard continuously until 0800, but no amateurs. Allan says no JA's have been heard as far south as Brisbane so far this year.

That's about all the news for the moment, so will close with the thought for the month: "When a man looks a woman straight in the eyes, she'd better do something about her figure".

The Voice in the Hills. ■

AROUND THE TRADE

R. H. Cunningham Pty. Ltd. advise that as from Monday, 10th May, 1976 a new office was opened in Western Australia at 256 Stirling Street, Perth, 6000, telephone 28 3655. ■

VK3ALI ON THE AIR

Dr. G. Ungar, VK3AOU.

VK3ALI is on the air again! This is the call sign of the "Austin Electronics Society", situated at the Austin Hospital, Heidelberg, Melbourne. The station was operational in 1970/71 when a licensed amateur was on the Medical Staff, but went QRT when he left.

In 1974, Dr. Gerald Ungar (VK3AOU, ex-G3XIF) joined the staff of the Spinal Injuries Centre of that hospital. Delighted to find the station there, he tried to put it on the air again using the old 2 metre equipment, which was however found to be unserviceable.

Some members of the Heidelberg Rotary Club heard of the station and its problems and the Club offered to finance its re-equipment. Accordingly, a Uniden 2020 transceiver, TH6DXX and rotator were obtained.

With the help and encouragement of the Administration of the Hospital, the Engineering Department made a 20 foot mast, and installed the antenna on the roof of a boilerhouse, giving a total height of the antenna above the top of the hill on which the hospital is situated of about 50 ft. Its effectiveness is shown by contacts in 25 countries and 4 continents in 6 weeks, in a total operating time of under 30 hours.

The station is situated in the rehabilitation ward of the Spinal Injuries Centre, and is on the air whenever Dr. Ungar is free from his other duties — usually during the mid-day break on Tuesdays, Wednesdays and Thursdays and sometimes later in the afternoons of these days. At present 20 and 15 metres are used, but 80 and 40 will also be available when an antenna for these bands is installed.

The objective is to "expose" the patients to amateur radio — while many quadruplegics and paraplegics return to work, some are largely restricted to their own homes, and a few to private hospitals or nursing homes for many years. Amateur radio can therefore add another dimension to their lives, giving an absorbing interest and a chance for contact with people "outside". In some cases also, both in Australia and overseas, an interest in amateur radio has led to the employment of severely disabled people in electronics or as professional radio operators.

Another item of general interest is station VK3ZZ and the owner club — The Disabled Radio Amateurs Club, 79 Buckhurst St., South Melbourne, Vic. 3205 — believed to be the only organisation of its kind in Australia. ■

IONOSPHERIC PREDICTIONS

Len Poynter, VK3ZGP

In recent months I have run across journals that have, in retrospect, analysed the previous months propogation conditions and with charts, showing the variations to normal over the various bands.

One in particular deals with European conditions from HF right through to UHF. They have been correlated into sporadic E, Tropospheric or any other type of opening. It would appear that late '75 produced some very good 70 cm openings right around Europe. Mention was made of the 10 metre beacons and a list of same is reproduced here for those interested.

28.170 ZL2MHF, 28.175 VE3TEN, 28.180 ZC4CY, 28.190 JA1IGY, 28.195 DJ0IJI, 28.200 3B8MS, 29.000 DL0AR.

Earlier this year ZL2MHF was heard at good strength in Melbourne.

To those interested in the do-it-yourself predictions, the use of the Solar Flux and A indices can be augmented by a simple solar observation system using a telescope, projecting the sun's image onto a screen to observe visible sunspots. With the increasing number of Cycle 21 spots appearing, it is worth the effort to take a daily look for spots.

Cycle 21 spots appear in high latitudes both North and South of the sun's equator, whilst Cycle 20 spots appear around the equator.

First signs following spot sighting is an increase in the Solar Flux, usually following a spot appearing around the Eastern rim of the sun. A good spot will travel across the sun in approximately 13 days to disappear around the Western rim. A really good one should appear again a total of approx. 26 days after first sighting.

Comparison of the Solar Flux scan charts also plot the travel of the spot across the sun's face. A rule of the thumb shows a quiet sun (no spots visible) as a Solar Flux of around 68.

A daily count of 20,	Solar Flux 75
35	80
40	90
50	95
100	120

As is well known, the daily count is seldom known generally, only the monthly mean and the 12 month running smoothed mean. These daily variations are quite useful and an indication of conditions now. So use of the Solar Flux (ex. WWV) and the A index (low good, high poor) can assist the amateur greatly. Learn to recognise the signs and use them to your advantage.

Keep an ear on 10m in July and August, this would appear to hold some promise this year.

May has finished with some 18 days without visible spots. The Solar Flux fell to a low of 66 similar to last year at this time. July, August '75 saw a rise in solar activity; it is quite possible it will happen again this year. Be prepared. ■

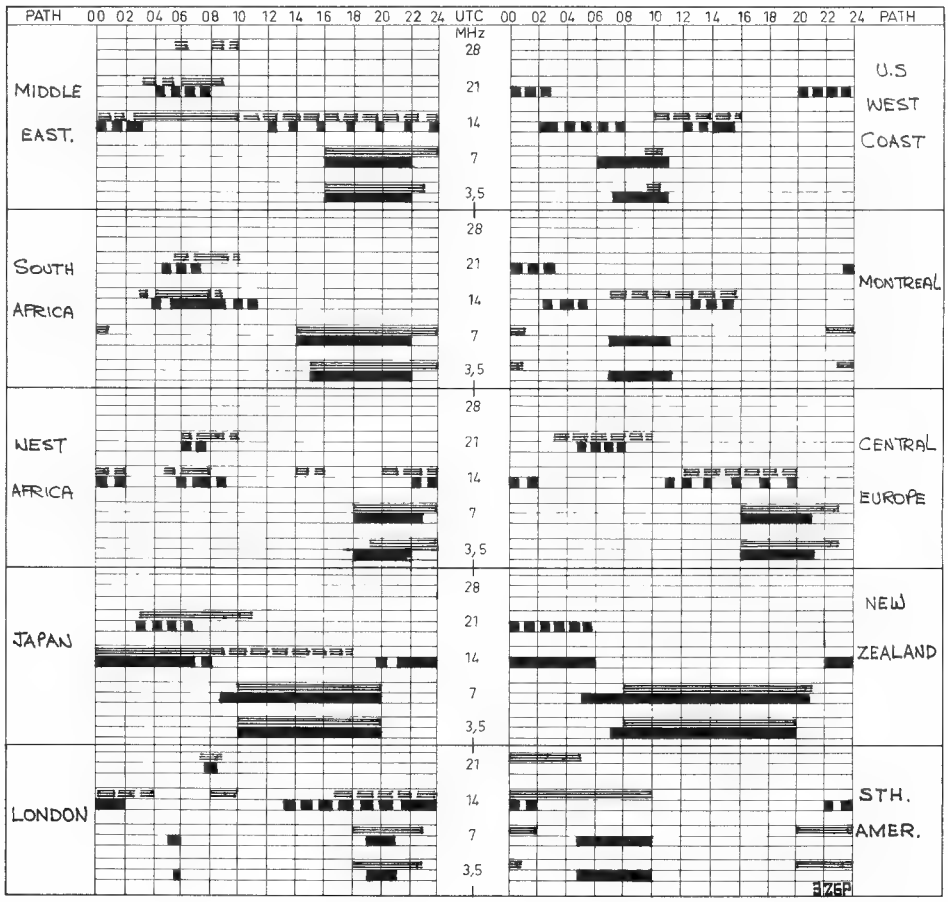


CHART LEGEND —
LINES: FROM WESTERN AUSTRALIA.
BARS: FROM EASTERN AUSTRALIA.
SOLID BARS/LINES: BETTER THAN 50% OF THE MONTH BUT NOT EVERY DAY.
BROKEN BARS/LINES: LESS THAN 50% OF THE MONTH.
(Useful at period of increased solar activity.)
ALL TIMES: UNIVERSAL (GMT).
PREDICTIONS: COURTESY I.P.S. SYDNEY.
ANTICIPATED GEOMAGNETIC STORMS: JULY 9, 15.
ANTICIPATED EXHALTED CONDITIONS: JULY 7-9, JULY 13-15, AUGUST 1-3.
LISTEN WWV DAILY HOUR PLUS 14 MINS.
WWV/H DAILY HOUR PLUS 18, 45 MINS FOR YESTERDAYS SOLAR FLUX AND A INDEX.

HAMADS

- Eight lines free to all WIA members. $9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Commercial advertising is excluded.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.

FOR SALE

KW 2000A Viceroy Transceiver 160-10m, complete with AC and DC power supplies, in perfect working order. $350. Bob Cunningham VK3ML, QTHR. Ph. (03) 20 7780.

FT101B Transceiver, no marks, no mods., works FB, with CW filter and manual, $520. Tom House VK2BTH, 34 Wolseley Rd., Lindfield, 2070. Ph. (02) 467 2773.

FT101 Mk 1, $360. Hallicrafters SR150 80-10 XCVR, VOX, cal. etc. with P/S speaker etc., $250. SBE34 AC/12V DC solid state XCVR, 125 watts 80-15, very compact, $250. Heath SB101 deluxe XCVR with matching speaker P/S, as new, $325. VK3OM, QTHR. Phone (03) 560 9215.

BWD 504 DC—6MHz CRO with external dual trace adaptor, still has 6 months warranty, $200 ONO. Realistic DX160 all-band Rx with inbuilt 6-digit clock, still under warranty, $150 ONO. 6M Transceiver as per Sept 68 AR, not yet operational, beautiful metal work, best offer. ETI crosshatch/dot generator, $15 ONO. FT101B remote VFO, $75 ONO. Reason for sale of above is unpassable offer of FT101B. Mike VK1ZMV, QTHR. Ph. (062) 83 2215 Bus.; (062) 81 1312 A.H.

18AVT All-Band Vertical for 80-40-20-15-10, self-supporting on base mount, $50. Ron May VK1PM. Ph. (062) 83 2213 Bus.

Saunders SG478 signal generator with spare Klystron, 1.2-4.2 GHz, $50. 3 WJ Backward Wave Osc. 2-4 GHz, $20 each. Ex-PMG crystal mixer and IF pre-amp plus 40 MHz IF strip, spare crystal, $15. Power supply 100-200 volt, 100 mA stabilised, metered, $15. C42 w/o P/S $10. John Sved, VK3ZVZ, 12 Great Valley Rd., Glen Iris, 3146. Ph. (03) 25 4953.

FTDX401 Transceiver, 80-10m, includes 11m, noise blanker, CW filter, good condition. No mike or speaker, but in original carton. John Kitchin VK6TU, QTHR. Ph. (092) 49 9342 A.H.; (092) 26 5278 Bus.

FTDX560, ex. cond., oscilloscope Heath 0-12-U MTR13, multi chan. "A" — "2" Melb. Leader multi chan. 53.032 MHz. Photographic enlarger — all good condition. Sensible offers. Roy VK3ARS, 30 Cook St., McCrea, 3938.

QM70 High Power 2 Metre Transverter, $180 ONO. Phillips cassette deck 2500, $15. G. Hambling, QTHR, VK5AS.

VHF High Band FM 2m Base Station, valve type, never used in service, separate Rx, PSU (AC type) Tx, and full metering panel, Rx is single channel double conversion type with 60 kHz filter, Tx has xtal oven, and a QQVO3/CO driven into a QQVO3/20 final, mounted on a 19 in. rack, brand new condition, $85. VK3AQB, 76 David Ave., E. Keilor, 3033. Ph. (03) 337 4902.

Crystal Filter Piezo Technology Type 1468, 10.7 MHz (FM) plus/minus 15k min, 2 dB ripple, 2 dB loss, 5k in/out, min. flat pack, $25 or exchange for SSB filt. VK2ZRD, QTHR, but P. Code 2082.

Crystals Pye H1Q, 45.100 MHz D, 45.666 MHz D, 45.000 MHz K. Offers VK2ZRD, QTHR, but P. Code 2082.

Amateur Radio Journals — March 1969 to Dec 1975, 81 vols. (May Vol. 37, No. 5 not received), $40.50 ONO. A. G. Hall, P.O. Molloy, 4880, N.Q.

Trap Dipole AL48DXN, 40-80m, has had little use and is complete, $20. VK3AEP, QTHR. Ph. (03) 90 2568.

ZL Mini Quad for 14 MHz, galv. pipe and dowel construction, 9 ft. boom, exc. cond., $35 ONO. VK3ZR, Ph. (03) 89 4645 A.H. QTH NOT R.

FT560 with 600 Hz CW filter, noise blanker and FV401 VFO, mint condition, $430. VK2SM, QTHR.

MR-6A on 52.525 and 52.656, YL1240 PA, **25W** O/P, 12BY7 driver, ch. sw., $50 ONO. BS-6A **Mini**-Base, 240V AC, 10 ch. name yours, $100. **MR-6A** Mobile, 3 channels, prov. for 6, $40. 52/**54 MHz** SSB Tx, self-contained in FL50; 6146B PA, **50Wi/p,** ext. RF out, 80 through 10; Int VXO; FV**50 VFO** incl., $75 ONO. 144/148 MHz SSB Tx, **mod. FL50** as above, no HF left except 20m, FV**50B VFO,** QQE03/20 PA, 50 Wi/p., $75 ONO. FR**50 HF Rx** 80-10m, cer. resonators in IF, good **perf., match.** speaker, $100 ONO. Complete Novice **Set-Up,** FR50B, FL50, FV50C, Rx has Kokusai M/F **Bandsw.** 80-11m, Tx has VCXO and Mod for **novice power** required. Will convert back to 50W **all band rig,** $350 incl. FRDX400 Del. All filters, **FM module,** 6 & 2m conv. Drake 5B N/B. All **10m plus,** 11m plus, 27.5 to 28, $350 — no offers. **FTV650,** clean, just bought, $100 ONO. All the **above** gear supp. with circuits/manuals. Selling **due to** passing Full Call and lack of space — many other VHF goodies. Please call (03) 88 1110 **AH,** if not home, leave message and phone **No.**

Drake TR4C Transceiver, brand new, AC-4 PSU, RV-4C VFO, 34-PNB noise blanker, KW-107 supermatch, Shure 201 mike. $1000 or part exchange lower price rig, VK2ASH, QTHR. Ph. (02) 270 5184 Bus.

Two 4-125A Tetrodes plus ceramic bases and anode heat diss. caps, suit 400 watt PEP linear for 80-10m, similar to the VK3AAR described in May AR. $40 including postage from VK2ZDJ, 45 Blumer Ave., Griffith, NSW 2680.

Power Supply, 3 outputs, 10V-10A regulated, 10V-10A regd., 24V-5A not regd., rack mount, 32 kg, $80. P. Hadgraft, 17 Paxton St., Holland Park, Q. 4121. Ph. Bus. (07) 224 2343, AH (07) 397 3751.

Transceiver FT101, complete with microphone, carrying case and instruction book, factory mod. kit for 160m installed, first class order, in all respects, $395. VK3ARP, QTHR. Ph. (03) 80 4279.

Heathkit SB102 — 80-10m Transceiver, 180W PEP, USB-LSB-CW, 2 x 6146 finals, fitted with extra 400 Hz CW filter together with HP23 AC power supply and handbooks. Unit is 2 years old and as new, will freight on $350 firm. VK4VK, 6 Tosti St., Sorrento, 4217. Ph. (075) 38 4164 after 18.30h local.

Yaesu FT2FB 2m Transceiver, ch. 37, 40, 43, 50, simplex R1, R2, R3, R4, R5, R6, old R1, R4. Paul F. Bell VK1ZPB, 28 Nullagine Street, Fisher, ACT 2611. Ph. (062) 81 2824 Bus. (062) 88 7953 AH.

FT2FB as new simplex ch. 40, 50 and 64, repeaters 42/54, 45/57 and 48/60 with mic., manual and metered reg. power supply, $160, also Lafayette HE30 GP Rx, 530-30000 kHz band spread, manual, original carton, etc. $50; both ONO. VK2OR, QTHR. Ph. (02) 86 4558.

ICOM IC-22A, 2m FM Transceiver, ch. 1, 3, 4, 5, 40, 50, with manual mint condition, little use, mobile mounting cradle, 240V AC — 12V DC regulated power supply and 10 el. yagi with TV mast, the lot $220, buyer arrange collection. VK2PT, QTHR. Ph. (049) 43 1308.

Katsumi Mic. Compressor, MC-225, with instructions, works well, $20 ONO, VK3LJ, QTHR. Ph. (053) 32 3412.

WANTED

RF Ammeter, 0-3A (or similar). VK3LJ, QTHR. Ph. (053) 32 3412.

Minibeam HQ1 or B24. VK6PF, 37 Landsborough Way, Padbury, WA 6025.

Past Issues of Amateur Radio Magazine. 1969: March and July; 1970: Feb, May and Dec; 1971: April; 1972: June and July. VK3ZDJ, QTHR. Ph. (03) 857 6824.

Buy or loan manuals and/or circuits diagrams of sig. generators Marconi TF801A and Palec SG1. S. Parr, VK2ASP. Ph. (02) 93 1302.

18AVT in good condition. VK3AKU, QTHR. Ph. (03) 598 5892.

Windlight, or parts for a windlight, propellers especially, any voltage output, inverters DC in, 240V AC out, or similar, would be pleased to hear from anyone with experience in this field. Also require 50-75 ft. crank-up tower (not for windlight). All replies will be answered. L. MacDonald, VK3YHA, 317 Eureka Street, Ballarat, 3350.

Handbook and/or Circuit Diagram, copy or purchase for Ellco 25W HF Transceiver type 6619. T. Connell, Box 718, Madang, PNG (air mail).

SILENT KEYS

It is with deep regret that we record the passing of —

Mr. C. R. JONES	**VK2BJA**
Mr. R. F. BURTON	**VK3IH**
Dr. D. D. WATSON	**VK3OD**
Mr. J. B. BATTRICK	**VK3OR**
Mr. R. HOWES	**VK3ZEW**
Mr. A. H. BROOKS	**VK5AH**
Mr. N. MARNIE	**VK5NM**

ARTHUR W. THURSTAN VK2AV.

The sudden death of Art, on 26/5/76, saddened many in VK and overseas.

Art applied the discipline, gained as a scientist, to the mateur art, and kept abreast of the new techniques, and procedures, in his radio interest spanning half of the century.

To anyone privileged enough to partake of the hospitality of the Thurstan home, and there were many, a vivid memory of Art, and Janet, will remain.

Art's main activity was in the CW field and, as a founder of the CW net, he retained his interest in the promotion and performance of the net to the end.

Vale Master.
VK2SM

Crystals between 3525 and 3575 kHz, RF choke 2.5 mH 4P1 60 mA rating, and twin gang tuning capacitor, approx. 415-450 pF per section. John Windebank, Kangaroo Ground Rd., Warrandyte, 3113. Ph. (03) 844 3222.

CONVENTION

CQ Convention, Rockhampton 28-29 August — for fun in the sun. Prelude to Capricana Festival. Official switch on VK4RAR. All the usual activities and more. Member of Executive present. Smorgasbord Dinner. More details: WIA CQ Branch, Box 496, Rockhampton, 4700.

DISPOSALS

Free for the taking away: 35 ft. Antenna Pole, tapers from 6 in. at base to 3½ in. at top, painted white. VK3DA, QTHR.

STOLEN EQUIPMENT

Uniden 2020, Serial No. 50910013, stolen from QTH at Frankston on 16th June, 1976. Any information please to Brenda VK3KT, telephone (03) 787 5350.

20 YEARS AGO

Ron Fisher, VK3OM

July 1956

Amateur Radio for July 1956 featured the report of the first TVI field test. This was carried out by five members of the NSW Division TVI committee. They had constructed a receiver covering the frequencies of the local television channels, which they then used to measure the relative harmonic output of two different transmitters.

N. C. White, VK5ZAW described how to convert the SCR522 genemotor from 24 volts operation to 12 volts operation. At this time, transistor power supplies had just not quite arrived on the scene and so either vibrator or genemotors were needed. The amount of primary current needed by these monsters would flatten a car battery in short time.

July was a lean month for technical articles with the rest of the issue being taken up with the Remembrance Day Contest rules, some amendments to the National Field Day results as well as the usual monthly columns.

Notes from each of the divisions took up considerable space in Amateur Radio in those days. July ran to three full pages of very small print, The Editorial page for July looked at that section of the Amateurs Code that states, 'The Amateur is a Gentleman'. No doubt if this was rewritten today we would need to change this to 'The Amateur is a Gentleperson'. However which way it is stated, I hope it still applies. ■

SIDEBAND ELECTRONICS SALES

ATLAS models 210-X and 215-X 80 to 10 & 160 to 15 M transceivers inclusive factory installed noise-blankers. **only $600**

ICOM model IC-202 2 M SSB portable transceivers 144-144.4 MHz. **now only $180**

Model IC-502 6 M SSB portable transceivers 52 to 53 MHz. **now only $175**

YES, we feel some newcomer in this game requires a bit of honest competition and there is more to come after we get really organised and our teeth bitten into it deeply!!

UNIDEN model 2020 AC-DC transceivers 10 to 80 M with 3 crystal filters **$550**

TRIO-KENWOOD model TS-520 AC-DC transceivers 10 to 80 M. **Still only $530**

YAESU-MUSEN model FT 101-E AC-DC transceivers 10 to 160 Mw. speech processor **$650**

TRIO-KENWOOD model QR-666 receiver 170 KHz to 30 MHz AC-DC. **Now only $225**

BARLOW-WADLEY model XCR-30 MK II portable DC communications receiver **$180**

HY-GAIN ANTENNAS

14AVQ 10-40 M. verticals, 19' tall, no guys	**$65**
18AVT-WB 10-80 M. verticals, 23' tall, no guys	**$90**
TH3JR 10-15-20 junior 3 el. Yagi 12' boom	**$135**
TH3MK3 10-15-20 senior 3 el. Yagi 14' boom	**$180**
TH6DXX 10-15-20 senior 6 el. Yagi 24' boom	**$225**
HY-QUAD 10-15-20 cubical quad Yagi 8' boom	**$200**
TIGER ARRAY 204BA 20 M 4 el. Yagi 26' boom	**$190**
BN-86 balun	**$18**

ANTENNA ROTATORS

Model CDR AR-22 junior rotator for small and light beams **$55**

Model CDR Ham-II for all hf beams except 40 M ones! **$165**

KEN model KR-400 for all medium size hf beams with internal disc brake **$100**

KEN model KR-500 for vertical elevation control of satellite tracking **$100**

All models rotators come complete with 230V AC indicator-control units.

4-conductor light cable for AR-22	**20 cents per yard**
12-conductor light cable for Ham-II	**30 cents per yard**
8-conductor heavy cable for Ham-II	**70 cents per yard**
6-conductor heavy cable for KR-400-500	**60 cents per yard**

DRAKE W-4 SWR—WATT METER 0-200 and 0-2000 Watt scales	**$60**
DRAKE TV-1000 TVI Low pass Filter	**$25**
SINGLE METER SWR METER	**$12 and $15**
TWIN METER SWR METER	**$22**

MARK MOBILE ANTENNAS

Helical 6' long HW-40 for 40 M.	**$18**
High power KW-40 for 40 M.	**$25**
HW-20 for 20 M.	**$16**
Swivel mobile mount and chrome plated spring for all	**$12**

ASAHI MOBILE ANTENNAS

AS-2-DW-E ¼ wave 2 M. mobile whip	**$8**
AS-WW ⅝ wave 2 M. mobile whip	**$18**
AS-GM gutter clip mount with cable and connectors	**$10**
M-Ring body mount and cap for ¼ M. whips	**$5**

CUSH CRAFT ANTENNAS

Model DGPA 27-52 MHz adjustable ground plane	**$25**
LAC-2 lightning arrestors	**$4**
AR-2X Ringo Ranger double ⅝ vertical for 2 M.	**$35**
ARX-2 extensions for the Ringo 2 M. vertical	**$15**
A147-11 11 elements 2 M. Yagi	**$35**
A147-20T combination horizontal-vertical 2M Yagi 10 el. each	**$60**
A144-20T same as A147-20T but for combination vert.-hor. polarisation	**$60**
CR-1 27 to 29 MHz ⅝ Ringo vertical	**$35**

CRYSTAL FILTERS 9 MHz, similar to FT-200 ones, with carrier crystals **$35**

KYOKUTO 2 Meter FM 15 Watt output transceivers with digital read-out and crystal synthesized PLL circuitry, now with 800 transmit and 1000 receive channels 5 KHz apart, covers all of 144 to 148 MHz, receive to 149 MHz, no more crystals to buy, includes simplex, repeater and anti-repeater operation. **Still only $300**

TRIO-KENWOOD model TS-700A FM-AM-CW-SSB transceivers, full 144 to 148 MHz coverage, 10 Watt output VFO controlled, self contained AC-DC operation **$575**

FERRITE CORE BALUNS cheaper Japanese product for up to 500 W RF **$12**

COAX CABLE CONNECTORS-SWITCHES Amphenol type male for RG8U and RG58U cable, two types, female chassis mount, double male, double female, all types **100 cents each**

Amphenol angle and T-connectors	**150 cents each**
3 Position coax switches	**$10**
RG-8U coax cable ⅜" diam.	**80 cents per yard**
RG-58U coax cable 3-16" diam.	**30 cents per yard**

Add $1 cutting and handling cost for coax and rotator cable orders

P.T.T. DYNAMIC MICROPHONES 50K or 600 ohms with 4-pin Jap. plugs **$10**

27 MHz TRANSCEIVERS 5 Watt AM 6 channels with 27.800 MHz crystals **$75**

1 Watt hand-held 3 channels 27.240 crystals	**$50**
15 Watt PEP 23-channels AM-SSB model SE-501	**$175**

All prices quoted are net SYDNEY, N.S.W. on a cash with order basis, sales tax included in all cases, but subject to changes without prior notice. No terms nor credit nor C.O.D. facilities, only cash and carry, no exceptions. ALL RISK INSURANCE from now on free with all orders over $100, small orders add 50 cents for insurance. Allow for freight, postage or carriage, excess remitted will be refunded.

NEW ADDRESS—

SIDEBAND ELECTRONICS SALES

P.O. BOX 184 SUTHERLAND

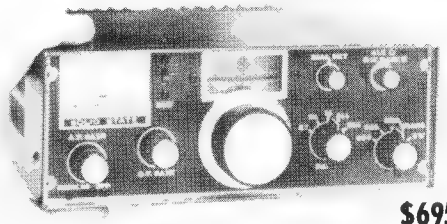
POSTCODE 2232. TELEPHONE 02-521-7573

For personal attention, 24 Kurri Street. LOFTUS. POSTCODE 2232

PETER SCHULZ, VK2ZXL

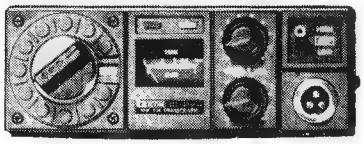
VICOM VICOM VICOM VICOM VICOM VICOM VICOM VICOM VICOM VICOM VICOM VICOM VICOM VICOM VICOM

HAM RADIO HEADQUARTERS!



5 Bands, 200 Watts Input **$695**

The Atlas 210X/215X transceiver combines amazing selectivity, strong immunity to overload and cross modulation and superb solid-state design in the one 7lb package! This fabulous rig runs 200w pep input with no transmitter tuning necessary due to the broadband design. Complete with noise blanker, 90 day warranty. Delux mobile mounting kit $55 extra, AC console $165 extra.



$219

IC22A 2m FM MOBILE

The superb IC22A is Australia's biggest 2m fm seller. Perhaps it's due to the solid-state T/R relay, P.A. protection, 5 helical resonators and the proven trouble-free performance. Then again, the great intermod attenuation in the receiver front end together with excellent sensitivity (4 microvolts for 20dB quieting) must have won a lot of hearts! Maybe the VICOM pre-delivery checkout, the after sales service and the factory-supplied spare parts has helped. Certainly strict quality control including rigid environmental tests on all rigs has enhanced the IC22A's reliability and its success in the World Amateur Market. Why not take part in this success story? All rigs come complete with mic, brackets, cables, English manual, 6 channels from the Bandplan and the VICOM 12 month warranty. Price $219 including sales tax.

HF TRANSCEIVERS

Kenwood TS-520 80-10m Transceiver .. $598
Yaesu FT75B – ideal for the novice $280
– FP75B AC pwr supply ..... $ 70
– DC75B DC pwr supply ..... $ 75
– Rig + both pwr supplies $400

ANTENNA COUPLERS

CL-666, 2.5kW, 80-10m, heavy duty, superb construction $235
CL-66, 500W 80-11m, built-in 4 position co-ax switch ..... $ 98
CL-99 200 watts for 2m band ..... $ 47

TEST GEAR

YO-100 monitorscope $215
YC-355D frequency counter $290

2 METRE ANTENNAS

ARX2 Ringo vertical ..... $ 40
DINGO X2 Identical to above but locally manufactured ..... $ 35
LA210W twin boom 10el stacked beam . $125
AS210BN twin boom 18dB gain ..... $ 99
AS210AN single boom 14.5dB gain ... $ 38
Y7 crossed yagi, 7el with 7dB gain .... $ 65

HUSTLER WHIPS

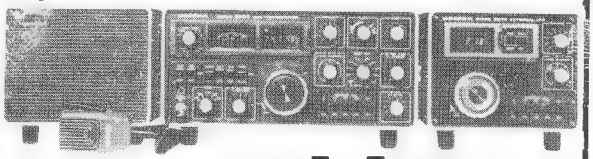
RM-80 (80 metres) ..... $ 26
RM-40 (40 metres) ..... $ 25
RM-20 (20 metres) ..... $ 20
MO-2 mast ..... $ 26
BM-2 bumper mount ..... $ 15

HF TRAP DIPOLES

Midy IIIN trap dipole 40-10m . $ 38
Midy VN trap dipole 80-10m .. $ 44
AL48DXN trap dipole 40-80m . $ 38
AL24DXN trap dipole 20-40m . $ 28
14AVQ trap vertical 40-10m .. $ 59

ANTENNA ACCESSORIES

Ham II Heavy Duty Rotator ... $175
CD44 medium Duty rotator ... $140
U-200 light Duty rotator ..... $ 62
Rak dipole balun ..... $ 22



$570 **uniden**

The fabulous Uniden 2020 phase-locked-loop transceiver offers separate usb/lsb/cw 8-pole crystal filters as standard and 6146B's in the final with screen voltage stabilisation for minimum distortion products. Features plug-in pcb's and even the front panel can be swung out for easy servicing. A full spares catalogue is available together with change-over pcb's. Compare the Uniden 2020 with other HF transceivers and you'll be quickly convinced that it offers the best value! The price $570 includes mic, cables, plugs, English manual and VICOM 90-day warranty! But don't get caught – VICOM is the only factory-authorised dealer for Australasia.

ICOM IC-202

144MHz SSB CW 3W TRANSCEIVER

* Coverage 144 145MHz 144 0 – 144 2 144 2 – 144.4 (crystals provided) Provisions for other crystals (200KHz per xtal)
* VXO operation giving 200KHz with excellent stability
* pep output 3 watts
* cw output 3 watts
* RIT tuning ± 3KHz
* noise blanker

$210

Comes complete with plugs, microphone, English manual, carry-strap and dry cells. All sets given pre-sales, check-out and as VICOM is the sole authorised importer for Australia, a factory-backed supply of spare parts and accessories is available.

ICOM QUALITY PORTABLES

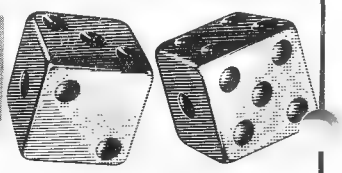
IC-502

50MHz SSB CW 3W TRANSCEIVER

* Coverage 52 54 MHz VFO controlled
* pep output 3 watts
* cw output 3 watts
* RIT tuning
* noise blanker
* receiver sensitivity 0 5 uV (S+N)/N 10dB
* receiver selectivity 1 2 KHz 6dB 2.4 KHz 60dB
* audio output 1 watt
* battery external supply 13 8V @ 15%
* size 183 x 61 x 162 mm
* mass 2.1 kg

$219

ICOM



VICOM VC-2 SWR/PWR meter
Operates 80-2 metres 12w/120w with max power 1000 watts pep at 52 ohms. A must for every shack! Price $25. **$25**

Why take the gamble? All rigs sold by VICOM are given a thorough pre-delivery checkout supported by technical expertise and well equipped workshops. Spare parts are available too!

Kenwood TS700A
Features:
* SSB/cw/fm/am 144-148 MHz
* SSB 20w dc input, FM/CW 10w output, AM more than 3 watts output.
* repeater operation normal or reverse
* ac/dc capability **$595**
* Includes mic, cables, plugs, English manual and VICOM 90-day warranty!

VICOM FOR PERSONALISED SERVICE

2M FM

IC22A incl. 6 channels, 12 month warranty $219
IC215 portable, 4 channels, 12 month warranty $160
DV21 PII VFO for IC22A/IC21A $285

MIC COMPRESSORS

MC33A, ac/dc, level control, 2 tones ..... $ 62
MC22, as above – but no compression meter ..... $ 49

VICOM Cables & Telegrams "IZYCOM" Melbourne, Australia

Head Office & mail orders . . .
139 Auburn Rd, Auburn, Vic. 3123 Ph: (03) 82-5398
Sydney Branch . . . (Manager – Jack Gilham)
23 Whiting St, Artarmon, NSW 2064 Ph: (02) 439-1271

Prices and specifications subject to change without notice. Prices include Sales Tax and Insurance anywhere in Australia but exclude freight.

THE W.A. BULLETIN

WEST AUSTRALIAN SUPPLEMENT TO " AMATEUR RADIO " JULY 1976.

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BULLETIN EDITORS.	L. BALL	VK6AN	813055x21
	R.GREENAWAY	VK6DA	242909

All material for inclusion in the Bulletin, to reach the Editors by phone or mail to:- 22 Salisbury St., Leederville. W.A. 6007. by the 10th. of each month.

CORRESPONDENCE. All other correspondence to :-
Hon. Secretary, W.I.A. (W.A. Div.),
P.O. Box N1002.
G.P.O. Perth. W.A. 6001.

DIVISIONAL NEWS BROADCAST. VK6WI.
News Items assembled and broadcast initiated by D. Reimann VK6DY
Phone 871103.

SUNDAY 0930	W.A.S.T.	
80 metres	SSB	3600 KHz.
40 metres	SSB	7080 KHz.
20 metres	SSB	14100 KHz.
6 metres	FM	52.656 MHz.
2 metres	FM	CHannel 1 Rpx.

GENERAL MEETING. Held on the THIRD TUESDAY of each month at 7.45 p.m. at SCIENCE HOUSE, 10 Hooper St., West Perth. Bring a friend !

COUNCIL MEETING. Held on the LAST TUESDAY of each month at 7.30 p.m. at WIRELESS HILL. Observers welcome.

SLOW MORSE PRACTICE SESSIONS. Practice sessions are conducted each week might Monday to Friday inclusive on a nominal frequency of 3550 KHz at 8.30 p.m. local time.

Tear-along-dotted line- - - - - - - - - - - - - - - -paste-in your-log-book.-

INTRUDER WATCH CO-ORDINATOR.

The I.W. Co-ordinator for this Division is:-
Mr. ALBERT CASH. Phone:095.274104
54B Frederick St.,
Shoalwater Bay. 6169.

INTRUDER WATCH. Albert Cash, I.W. Co-ordinator VK6 Div.

This is the first time that I have written in the Bulletin,so I had better introduce myself :- ALBERT CASH is the name, an SWL from way-back in the 1920's.

Until this time last year my QTH was Morwell, Victoria. I have been a member of the W.I.A. for eleven years and served for six years as the VK3 Division Intruder Watch Co-ordinator. I do not appear to be known too much around the VK6 Division, as the amount of I.W. reports received are few and far between despite requests by your Bulletin Editors to send or phone me with reports of Intruders (pirates - for that is what they are-).

How about sending along a list instead of QSY - ing up or down the band and then whinging about the QRM ? I know this happens, I've heard it so many times - not only in VK land, but overseas as well !

I received a detailed report from VK6RQ, which was a little ripper, and would like many more like it. We know that not everyone has RTTY or Fa FAX gear, but that does not stop one from passing on the callsign, frequency, type of traffic passed etc., even if you are an SWL,cant read the code etc, you have plenty of scope with Broadcast stations which continually appear in the 40 and 80 metre bands. Or, you may be a full call, with a shack full of gear - - all are welcome to take part in Intruder Watch activities!

What about giving an hour or two per month, and I will have a nice fat envelope to send over to our Federal Co-ordinator,Alf Chandler, each month. USE THEM OR LOSE THEM.

Editors Note. Our Secretary (and Federal Councillor) produced a set of the newly designed I.W. report forms at the June General Meeting.Further information should soon be appearing in "A.R."

SEND FOR YOUR F R E E Intruder Watch forms today.! ! ! !

****

SLOW MORSE TRANSMISSIONS.

Is there a member of the Brass Pounding community who would be willing to do the Tuesday evening session from 2030 to 2115 hrs ? Will someone please volunteer so that this scribe can take his lousy"fist" off the air. Volunteers please form a queue to phone Cliff Waterman on 250541 extension 262 MNI TNX OM

* * * * * * * * * * * * *

W.I.C.E.N.

Since Don VK6DY retired as Net Control, this post has been filled by a different station each week. Full marks to those who offer their services in this capacity. It can sometimes be a sticky proposition when the net contains a large number of people and several stations seem to lose sight of the fact that it is an EMERGENCY net not a NATTERERS NET.

* * * * * * * * * * * * *

R.D. CONTEST 1976.

Take heed oh ye of little faith - read the revised rules, gird your loins, polish the key,spit on the mike, organise a log-keeper, baby-sitter, tea lady or what ever and prepare to do battle.

What did you think of that agenda item from VK5, that they be allowed to keep the trophy if they won it six times in a row ? Youve got to admit that they are a well knit Division with a great ability to organise and WORK AS A TEAM. Quite a different kettle of fish from their slothful cousins in VK6 - - - - - Well aren't they ??

OMEGA NAVIGATIONAL INSTALLATION. Report from the Joint Committee on Foreign Affairs and Defence.

Omega is an all-weather, continuous, world wide position fixing system for surface ships, submarines and aircraft. It is one of a family of hyperbolic radio navigation aids; Omega uses radio signals with frequencies located in the Very Low Frequency (VLF) band between 10 and 14 kHz.

Omega Signals.

Signals in this frequency range penetrate the ionosphere to a much lesser extent than signals at higher frequencies. Accordingly, they present very stable and reliable wave fronts at great distances from the transmitter. Therefore, eight Omega transmitters, sited in a suitable global pattern, could provide sufficient redundancy (that is, over-lap of signals) to ensure a continuous reception of at least three reliable signals in virtually all parts of the earth.

Each transmitter emits a basic pattern, repeated at precisely ten - second intervals, consisting of successive approximately one-second intervals of frequencies 10.2, 11.33 and 13.6 kHz separated by intervals of 0.2 seconds. The remainder Of the ten-seconds repetition period may be used for transmission of frequencies for special purposes, or may not be used at all. The frequency, phase and timing of the transmission is controlled by the use of an extremely accurate frequency standard (Caesium- beam) and a clock driven by this frequency standard. No station can simultaneously transmit two frequencies, nor will the same frequency be transmitted simultaneously by any two stations.

Each of the transmitters is intended to have a signal range of about 12,000 kilometres. This range will require a radiated signal power of 10 kW. However, because a VLF antenna in this frequency range has a low radiation efficiency, the required transmitter power is 150 kW.

RECEPTION BELOW THE SURFACE OF THE SEA.

The penetration of radio signals below the surface of the ocean increases as the frequency of the signals is lowered. Far too little experimentation and observation has been carried out to enable maximum useful signal depth to be estimated reliably but it has been suggested that, under ideal conditions, 10 kHz signals from Omega transmitters may be received at a depth of 10 metres and possibly 15 metres under the surface of the ocean.

However, it is uncertain how reliable the signal at various depths and under adverse conditions. Most authorities believe that reliability is affected by the state of the surface of the ocean. Submarines can certainly receive Omega signals without surfacing or without floating an antenna on the surface, but it is uncertain how valuable the signals will be under different circumstances.

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JAMBOREE *ON * THE * AIR, 1976.

Once again a reminder to organise yourselves in preparation for this annual event . And a word of advice that I shall whisper in your shell-like ear. It's the good oil from the powers that be - - - -

DO NOT USE THE REPEATER CHANNELS FOR J.O.T.A. CONTACTS.

REMEMBER TO LEAVE A THREE SECOND BREAK BETWEEN OVERS IN CASE SOME OTHER GROUP WOULD LIKE TO SHARE YOUR CONTACT.

It's not a contest - just a happy week-end ragchewing with people having a common background of scouting, people whose experience and interests may differ completely from your own but who would welcome and value an exchange of ideas. An added bonus too is the opportunity which J.O.T.A. offers to attract others to the ranks of radio amateurs!

P/

HELLO NEW MEMBERS ! Bill Marchant L60255, Tony Clark VK6ZAC, Harvey Brain VK6- -, Peter Taylor VK6ET, Robert Kingston L60256.

-.-.-.-.-.-.-.-.

According to the computer readout of May 17, we have a membership as follows :-

Full Members	251
Associate Members	69
Pensioners, Clubs etc	34
Life members	5
	359

NOW THE BAD NEWS There are still 43 unfinancials "poling " on us!

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Now back to Glenn VK6KY who you should remember went to the trouble of concocting morse practice groups for your benefit last month. - - -

LESSON TWO.

F dididahdit ..-. G dahdahdit --. H dididididit .... I didit .. J didahdahdah .---

FGHIJ	GHIJF	FGHJI	HIHGF	GFGJF	JHGIF	HHIIH	FJHHI
FFJJJ.	GFGFJ	HFHGH	HIHIH	GFJFG	FJJGF	FJFJH	JJJJF
IIHHG	HJHFG	GFHHG	GJHIF	FFFJG	FFFHI	GGHFJ	IIIIH
IIHIG	JHFGI	JJGHF	HGJJF	FFFFF	HGJFI	HHHIG	JJJFJ
JGIGJ	FHGFH	FJGHI	HHHHH	HJGIH	GGGGJ	JJHIG	HFJGI
HGHJF	HHHGJ	JJFHG	GHFJG	JGIHG			

Revision of letters A to J.

ABCDE	FGHIJ	AEHGD	GABBF	FADAD	FJHDB	FHFDB	BDHJA	CIHJA
EDBHG	HIDEF	CBADH	BCJHJ	ACDBE	HAEDA	HEBAD	AFBCJ	AJAJA
BCDHG	ABABC	CDEFG	HIJHJ	FGHED	FGHJI	ADEFC	FHEDB	ADBCE
ABCDE	ACDBE	FJGHI	AJHFG	EHFGI	CBEDF	FGHJI	ADGHJ	IJHGF
BCDEA	ADFGH	JIBCD	AEDFC	FGHFH	BDGBD	ADADA	HIHIA	BDBGD

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SWL CORNER. Conducted by Mark THREE.

I am very elated with the amount of correspondence received this month. It is most heartening to see that there is still interest being shown in this column. This is what our listeners say :-

Dear Mark 3,

As you probably know (what dont you know) VK6PD went to t. Wells for Easter. On route we made a video tape of the Channel 3 repeater being installed at Mt. William. Many hours were spent calling CQ on 6 metres but despite our pleas for contacts(previuos weeks news) we had very few QSO's: however a few interesting waffles were had on 2m. Note- We dont really like waffling all the time but no-one seems to be interested in holding a stimulating conversation with us (we do however appreciate any QSO's).

During the field trip we took it in turns to have a minature bath in a washing up bowl (all other members being locked in the operating tent!). But tragedy struck again and Esther- while washing- flattened her new 3-dimensional glasses into 2 dimensions. This resulted in her glasses being "taped" to her head all weekend. Later Adrian, VK6ZDA, modified some of Esthers old lenses and now she sports a "'6PD Field Trip" pair of glasses. These consist of one active side and lense holder (in red) and one "neutral side (in black) with earthed nose bridge - we all know what happens when the active and neutral leads are connected together!

SWL CORNER cont.

VK6PD also went to Moore River on Saturday 15th and Sunday 16th. May. Unfortunately no full call was present,and despite our attempts (including rowing across the river and walking for miles up sand dunes) to locate high places we did not manage to work back into Perth.Esther true to tradition had her "assisted" swim in the river.

Just as a matter of interest,the members of the course Radio 2C at Mt. Lawley Technical College on Friday nights consists of Ron VK6TF, SWL's - Lindsey,Eric, Graham, Michael, Esther and myself and 3 other gentlemen. I also believe that David- VK6WT's Friday night AOCP course is full again this year.

About a year ago I purchased a small rotator,several months ago I acquired a 6 metre converter for my FT101E, a 5 element 6 metre beam and a section of tower for a very small dB rating from a retiring amateur. My husband (an excellent tower constructor) laid the concrete for the base and completed the tower. Last Saturday was very thrilling for me when Adrian'ZDA, Esther, Bob(XYM) and I completed the assembly and erected it- I must point out that it would have been impossible without Adrian's help - thank you Adrian - may all your DX come at once.

I am told that the length of this letter is in keeping with my image I believe that plans are afoot for a repeater on 432 Megs just for me, well maybe I wont waffle as much when the actual licence appears eh Glen? but thanks for your help and interest anyway guys. How's that for an unpunctuated mouthfull ?!

88's

Jill and Esther.

P.S. - my name is Gillian - pronounced Jillian.

It is always a delight to receive a letter from Jill and Est as they are always so informative. As to what I dont know, I can only say my sources of information are closing up. It is most unfortunate that salt mine activities do not allow me the time I would like to devote to SWL-ing and associated radio activities. I note with interest Esther's "assisted" swim,it would appear that she could be part mermaid,but it is hoped that all her "assistes" activities always end happily.

Now down to Peter in the icy wastes of Albany :-

Dear Mark 3,

It seems that the corner needs another kick in the pants from the great south. Once again Winter is here allowing me more time in the shack. Anybody interested in electronic keyers for Morse will no doubt have seen the article in "A.R." july '73.If not ,look it up now. I chose the keyer using OP amps. This unit was a first time goer.It has excellent speed rangeand the "self complete" feature. I made up a bug out of two bits of wood,a hacksaw blade,two bent bits of metal and two small screws. I'M still learning how to use it Hi ! During February this year I acquired a KP202 and most of the trimmings. But being me,I wasn't satisfied with it . For a start there wasn't any provision for external power supply,speaker, microphone or PTT. My ken now has all these features. The unit doesnt have any ugly brackets or loose leads attached to the case. All these functions are done thru 2.5 &3.5 mm sockets and plugs I have various leads which I can use in conjunction with the Ken,they are:-ext.PTT mike, ext. speaker and a small regulated PSU.The installation looks to be of commercial quality.Circuits and diagrams available by writing to me. During a stay in Perth I visited John VK6JX,he immediately took over my Ken Hi!The following day we went Push-bike,Elevator Pedestrian and escalator mobile.My Ken will never be the same. I believe that channel 1 is still recovering from that day Hi Hi !

73's

Peter J. Sumner L60216.

ON THE H.F. BANDS. contributed by L60232.

My main listening this month has been done during the day, and so I haven't any European DX to report. The one exception was at 10.30pm local time on the 3rd June, when I managed to get 15 minutes on "twenty". I heard VK6PM and VK6KR working IT9ZNW. As the signals were good I was surprised that I could find no other activity on the band. It could be my old antenna problem again, and perhaps Arthur Baxter should visit my QTH and give me a kick where necessary to make me put up a decent antenna. His efforts in the antenna field make me feel ashamed.

In case you think my receiver is a 20 metre monoband, I assure you that I do always give a listen on 15 metres but never seem to hear much. However I do plead guilty to neglecting 10 metres as I hamen't heard anything on it for years. I also neglect 40 metres mainly because of the Intruders. Often the desire to chase DX isnt there and I look for a good "ragchew" on 80 metres. There's usually a good one on Friday nights and last week's, the 4th June, was particularly interesting as the VK6 boys were discussing speech processors. Over the years, I suppose antennas have been the subject of more "on the air" discussions than anything else. Lately though, I've noticed a marked increase in discussions about speech processors. The general opinion seems to be that they are great for DX work, but tend to give an overload distortion effect on the shorter distance QSO's. I haven't noticed any distortion myself and I find that one of the best signals in the metro area is VK6CF and I assume that CHuck uses his processor most, if not all of the time.

On the 5th June at 4.15 p.m. local time I heard VK6ET working ZH1ZHK and JA1AX working YBØHH. The JA and YB stations were discussing " you've guessed it !) I also heard a threeway between VK6MO, VK5CA and W6ECF, but I'm not 100% certain of these callsigns as none of the stations used phonetics during the time I was listening. (Come on fellas, remember people coming in part way through a QSO, and use phonetics on every "over"

I also heard Jim VK6RU working ZE6JL. Nearly every time I hear Jim these days he seems to be working Africa. I also heard Bill VK6AS working 4S7CF in Colombo and G3VBK maritime mobile off the SW coast of Borneo en route to Tokyp. The G3 asked the 4S7 station to switch off his speech compressor as he was receiving distorted signals. Before I went for my evening meal I heard VK6CB working ZE6JL and VK6SW working ZE1DP.

The following morning, the 6th June, "twenty" was open "stateside" Iheard ZL2AX working K4PDV, and it made a change to hear their QSO as they were talking about "linears". I also heard WA4JBZ working K6JTN. The WA4's QTH was melbourne in Florida, I never knew they had one over there. One of the strongest VK signals was VK3CW in Alice Springs, heard working W6BQD whose signals suffered from QRM. Finally on the VK scene I heard VK4WIT working VK2BZ. VK4WIT is the callsign of the -- Townsville Amateur Radio Club. I always like to hear club stations as I feel that they prove our hobby is in a good state of health.

That's all for this month, so until the next time, -- 73's.

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XYL's CORNER. by JUNE.

Nothing in the mailbag this issue.

Congratulations are the order of the day to Ivy and Arthur Baxter on the safe arrival of their first grandchild - a girl.

Poppy Bradshaw, XYL of Les VK6EB is recuperating after her sojourn in hospital - all the best Poppy !

My OM cannot understand the lack of correspondence for this corner. He says " If the councillors are the backbone of the Institute, then surely the YL's and XYL's must be the JAWBONE !" CUL - June.

VHF NOTES.

VK6UU.

Kalgoorlie is the latest VHF active area to have a 2 metre repeater. The new repeater is located at the Hainhault Tourist Mine near Boulder.

The channel used is CHANNEL 4, and the equipment is a Pye F60 , the same type of equipment as is used in CH 2, Mt. Barker and CH 2 in Perth.

Those responsible for the installation were - Doug VK6QR and Louis VK6ZGQ.

This unit should provide a nice welcome for visitors arriving by road from the other side of the rabbit proof fence.

Unfortunately, repeater numbering has been revised to allow yet another repeater channel to be fitted into the 146 - 147 MHz segment.

The new channel is to be known as CHANNEL 1 and will operate with an input frequency of 146.05 MHz and an output on 146.65 MHz.

The new channels are :-

CHANNEL No 1.	146.05	146.65
2.	146.10	146.70 *
3.	146.15	146.75
4.	146.20	146.80 *
5.	146.25	146.85
6.	146.30	146.90 *
7.	146.35	146.95
8.	146.40	147.00 *

* Denotes channels currently in use in VK6.

What this means to you. As you can see, the "old " numbering no longer applies, so rigs with numbering from 1 to 4 will have to be re-numbered, or the operator will have to rely on memory.

It is interesting to note that only three years ago the 1 to 4 Primary repeater channels and the 5 to 7 Secondary channels were form - ulated. The 5,6 and 7 repeater channels have only come into use in the past year and a half. Now an eighth has been created with talk of extra channels in the 147 - 148 MHz segment. The speed at which FM and repeaters has moved has made Band Planning very difficult.

NOTE These new channel numbers are A CHANGE IN NUMBER ONLY, if you have CHs 1 to 4 already NO EXTRA CRYSTALS are needed - - only different numbers !

73 's - see you on channel 2 , 4 , 6 or 8 in the west.

Thanks Will, hope your holiday at Kalbarri was a good one !

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F O R S A L E.

FTDX 401, mint condition, three years old, never used, manual, PTT microphone, Osker dual face SWR & Power meter with manual, Speaker.

Hy-Gain Two Element, Triband Quad, complete with manual etc.

Philips Two Metre FM Model 1680, mount, microphone and antenna.

Lots of other bits and pieces including books. The lot -$400.

VK6JR - J.Ryan, 1 Frimley Pl., MORLEY. 6062. Phone 764749.

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TECHNICAL TOPICS.

RELAYS USED AS MAGNETIC SWITCHES.

The original use of relays was as power amplifiers in telegraphy and telephony,and many thousands are so used today. In this case,power measured in milliwatts is used to control many times more power. However by far the greatest application for relays is as magnetic switches.As many as a dozen circuits may simultaneously be connected,broken,and transferred by a single operation of one relay.Delayed action and multiple coils add to the usefulness and adaptability of these relays in complex devices.

It is important that the principal difference between relays designed andused as power amplifiers and those used as electrical switches be appreciatedIn the first instance,the voltage available for operating the relay may be less than one volt and the current be in the order of a few milliamps.Relays used in this application are of the so-called "sensitive" type, having contact gaps of a few thousandths of an inch and a contact pressure of a few grams.In the second instance, the source of power for operating the relay magnets is generally a commercial power line or a storage battery.Thus the availability of source power is important only as a design consideration.Of prime importance in this case are the factors of contact pressure, contact gap, contact area and power capacity,and low contact resistance.Added to these essentials are freedom from contact "bounce",wiping action of mating contacts, and the ability to operate millions of times without suffering the effects of fatigue.While the basic design of a relay affects all of these factors to some degree, most of them are not inherent but may be controlled between wide limits by the adjustment of the magnetic air -gap,tension springs,contact blade tension and shape,and spacing between adjacent contacts..

When a power relay which is to be used as a magnetic switch has been correctly adjusted, it is reasonable to expect that it should operate at least a million times before readjustment is necessary.Moreover, during this period,the contacts should not require attention in the form of cleaning or adjustment.

Contact pressure, necessary to reduce contact resistance, and contact gap, necessary to prevent arc-over, may be considered as implicit functions each of the other. Thus it may be seen that,as the blades or springs are stressed to increase contact pressure, allowable contact gap is reduced because of limitations of the magnetic operating force.

Due to the flexing of the blades and to the offset in the axis of curvature of the adjacent blades, a transverse motion is imparted to the contacts as they come together. This wiping action is very important as a means of maintaining clean contact surfaces and to break loose any tempory welding caused by high inrush currents. After the relay has been adjusted, each contact set should be examined to ascertain the extent of the wiping action.

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CLUBROOMS.

Most members are aware of the desperate need for the Institute to have its own building.It is not vital that the place be used to hold meetings, but more that it can be used to house our equipment and possibly workshop facilities.This would enable VK6WI to be set up in a permanent location making a roster of duty operators etc for the News Broadcasts a more viable proposition.Yet when the subject was raised by the chairman at the June General meeting,there was not even a ripple of interest or enthusiasm shown. WHY ?Surely someone amongst our 300 odd members must have a contact in the right quarters,or a reasonably sensible scheme. Please - if you can help contact council with your suggestion.We are always willing to listen.

1/8